



ATTO Technology, Inc.

## **ATTO FibreBridge™**

# **Installation and Operation Manual**

ATTO FibreBridge 1180E/D

ATTO FibreBridge 1290E

ATTO FibreBridge 2300E/R/D

ATTO FibreBridge 2350C

ATTO FibreBridge 2400C/R/D

ATTO FibreBridge 3300R

© 2005 ATTO Technology, Inc. All rights reserved. All brand or product names are trademarks of their respective holders. No part of this manual may be reproduced in any form or by any means without the express written permission of ATTO Technology, Inc.





# Contents

---

<b>1.0 Installing the ATTO FibreBridge .....</b>	<b>1</b>
<b>1.1 Cabling .....</b>	<b>3</b>
SCSI port connections	
Fibre Channel connections	
Serial port connections	
Ethernet connections	
<b>1.1.1 Using the Ethernet port .....</b>	<b>5</b>
FibreBridge 2400	
Other models (except FB 1180, 2400)	
<b>1.1.2 Using the serial port .....</b>	<b>7</b>
<b>1.2 ATTO FibreBridge 1180D .....</b>	<b>9</b>
Dimensions	
Environmental requirements	
Cooling	
Power	
Fibre Channel port	
SCSI port	
Serial port	
LED indicators	
<b>Installation instructions</b>	
<b>1.3 ATTO FibreBridge 1180E .....</b>	<b>11</b>
Board dimensions	
Environmental requirements	
Power	
Fibre Channel port	
SCSI port	
Serial port	
LED indicators	
<b>Installation instructions</b>	
<b>1.4 ATTO FibreBridge 1290E .....</b>	<b>13</b>
Board dimensions	
Environmental requirements	
Power	
Fibre Channel port	
SCSI ports	
Serial port header	
Ethernet port	
LED indicators	
<b>Installation instructions</b>	

**1.5 ATTO FibreBridge 2300R/D .....15**  
    Dimensions  
    Cooling and airflow  
    Power  
    Fibre Channel port  
    SCSI ports  
    Ethernet port  
    Serial port  
    LED indicators  
    **Installation instructions**

**1.6 ATTO FibreBridge 2300E .....19**  
    Board dimensions  
    Cooling and airflow  
    Power  
    Fibre Channel port  
    SCSI ports  
    Ethernet port  
    Serial interface  
    LED indicators  
    **Installation instructions**

**1.7 ATTO FibreBridge 2350C .....21**  
    Board dimensions  
    Cooling and airflow  
    Power  
    SCSI ports  
    Fibre Channel port  
    Ethernet port  
    Serial interface  
    LED indicators  
    **Installation instructions**

**1.8 ATTO FibreBridge 2400R/D .....23**  
    Dimensions  
    Cooling and airflow  
    Power  
    Fibre Channel port  
    SCSI ports  
    Ethernet port  
    Serial interface  
    LED indicators  
    **Installation instructions**

**1.9 ATTO FibreBridge 2400C .....25**  
    Board dimensions  
    Cooling and airflow  
    Power  
    Fibre Channel port  
    SCSI ports  
    Ethernet port  
    Serial interface  
    LED indicators  
    **Installation instructions**

<b>1.10 ATTO FibreBridge 3300R .....</b>	<b>27</b>
Dimensions	
Cooling and airflow	
Power	
Fibre Channel port	
SCSI ports	
Ethernet port	
Serial port	
LED indicators	
<b>Installation instructions</b>	
<b>2.0 Interfaces .....</b>	<b>29</b>
ATTO ExpressNAV interface	
ATTO BridgeTools (FibreBridge 1180 only)	
Command Line Interface (CLI)	
Menu mode	
<b>2.1 ATTO ExpressNAV interface .....</b>	<b>31</b>
Browser compatibility	
Open an ExpressNAV session	
<b>2.1.2 ExpressNAV pages .....</b>	<b>33</b>
Status	
Ethernet port configuration	
Serial port configuration	
SCSI configuration	
Fibre Channel configuration	
Storage management	
Time & date configuration	
Mapping	
Bridge management	
Advanced CLI configuration	
Update firmware (FB 2400 only)	
Restart firmware	
Help	
<b>2.2 ATTO BridgeTools for FB1180 only .....</b>	<b>35</b>
<b>2.3 Menu: text-based interface .....</b>	<b>36</b>
Conventions	
Examples	
<b>2.4 In-band CLI: SCSI over Fibre Channel .....</b>	<b>37</b>
I/O details	
<b>2.5 Command Line Interface use and guidance .....</b>	<b>39</b>
CLI error messages	
<b>2.5.1 CLI summary reference .....</b>	<b>41</b>
<b>2.5.2 General use commands .....</b>	<b>45</b>
Help	
Menu	
RestoreConfiguration	
SaveConfiguration	
VerboseMode	

## 2.5.3 Diagnostic commands .....46

AutoLogSense  
BridgeModel  
BridgeName  
ClearEventLog  
ClearTraceLog  
DispFcPortDB  
DisplayEventLog  
DisplayEventLogFilter  
DisplayTraceLog  
DisplayTraceLogFilter  
DumpEventLog  
DumpTraceLog  
EccLog  
ErrorLog  
EventLog  
EventLogFilter  
FCPortList  
FCSCSIBusyStatus  
FCTargets  
FCWWName  
FibreBridgeModel  
FibreBridgeName  
FixedLengthReqSense  
Help  
IdentifyBridge  
IdentifyFibreBridge  
Info  
ParityLog  
Performance  
SCSIPortList  
SCSITargets  
SerialNumber  
SNMPDumpMIB  
SNMPTrapAddress  
SNMPTraps  
SNMPExtendedTraps  
Temperature  
TraceLog  
TraceLogFilter  
Voltage  
WrapEventLog  
WrapTraceLog  
XCDevices  
XCError  
XCStatus

## 2.5.4 Maintenance commands .....51

Date  
FirmwareRestart  
FixedLengthReqSense  
IsReserved  
MaxOpTemp  
MinOpTemp  
OpTempWarn  
Reserve  
RestoreConfiguration  
SCSIPortReset  
SNTP

SNTPServer  
SpeedWrite  
SpeedWriteDefault  
Time  
TimeZone  
Zmodem

#### **2.5.5 SCSI configuration commands .....53**

AutoLogSense  
FCSCSIBusyStatus  
FixedLengthReqSense  
SCSIInitID  
SCSIInitID (FB 2400 only)  
SCSIPortBusSpeed  
SCSIPortList  
SCSIPortReset  
SCSIPortResetOnStartup  
SCSIPortSelTimeout  
SCSIPortSyncTransfer  
SCSIPortTaggedQueuing  
SCSIPortTermination  
SCSIPortWideTransfer  
SCSITermination  
SpeedWrite  
SpeedWriteDefault  
VirtualDriveResponse

#### **2.5.6 Fibre Channel configuration commands .....55**

BootFibreDelay  
BootScan  
BootScanPorts  
DispFcPortDB  
FcAck0  
FcClass2  
FcConnMode  
FcDataRate  
FcFairArb  
FcFullDuplex  
FcHard  
FcHardAddress  
FcInitiator  
Fcp2  
Fcp2Conf  
Fcp2CRN  
FCPortFailover  
FcPortList  
FCPortRecover  
FCSCSIBusyStatus  
FcTargets  
FcWWName  
FibreBridgeTargetLUN  
Performance  
ServicesLUN

#### **2.5.7 Serial port configuration commands .....58**

SerialPortBaudRate  
SerialPortEcho  
SerialPortStopBits



## **2.5.8 Ethernet configuration commands .....59**

- AutoLogSense
- DhcpFixedDelay
- EthernetSpeed
- Exit
- IPAddress
- IPDHCP
- IPGateway
- IPSubnetMask
- Password
- Ping
- ReadOnlyPassword (FB 2400 only)
- ReadOnlyUsername (FB 2400 only)
- SNMPDumpMIB
- SNMPTrapAddress
- SNMPTraps
- SNMPExtendedTraps
- Username

## **2.5.9 Mapping commands .....61**

- AddressMap
- AutoMap
- DispFCPortDB
- FCConnMode
- FCHard
- FCHardAddress
- FCPortFailover (FB 2400 only)
- FCPortRecover (FB 2400 only)
- FCTargets
- FibreBridgeTargetLUN
- LogicalUnitAddressing (FB 2400 only)
- Route
- RouteChange
- RouteDisplay
- RouteDisplay (FB 2400 only)
- RouteOffline
- RouteOnline
- SCSIInitID
- SCSIInitID (FB 2400 only)
- SCSITargets
- ServicesLUN

## **3.0 Configuring the FibreBridge .....64**

### **3.0.1 Handling multiple initiators .....65**

- Single initiator
- Multiple Fibre Channel initiators
- Multiple FC & SCSI initiators

### **3.1 Mapping .....67**

- Use ExpressNAV (except FB1180)
- Use BridgeTools (FB 1180)

#### **3.1.1 Route addressing .....69**

- Fibre Channel World Wide Name (WWN)
- Arbitrated Loop Port Address (AL\_PA)
- Addressing devices
- Manual SCSI device route mapping**

3.1.2 Static device addressing .....	71
3.1.3 Logical Unit addressing for FB2400 only .....	73
3.2 Optional configurations .....	75
Change the default username, password	
<b>Performance</b>	
Advanced diagnostics and SNMP protocol	
Read only password or username for the FB 2400 only	
Port Failover for FB2400 only	
4.0 Serverless backup support .....	77
How it works	
Procedure	
5.0 Updating firmware .....	79
Preliminary steps	
Update firmware on the FibreBridge 2400	
Appendix A Mapping command examples .....	i
AutoMap	
RouteDisplay	
RouteXxxxx commands	
AutoMap command sequences	
AddressMap	
Appendix A ATTO FibreBridge, FibreBridge family .....	v
iPBridge products	
Fibre Bridge products	
Appendix B Glossary .....	vii
Appendix C Standards and compliances .....	ix
Appendix D Fibre Channel accessories .....	xi
Appendix B Warranty, contact information .....	xiii
Manufacturer limited warranty	
Contact ATTO Technology, Inc.	



# 1.0 Installing the ATTO FibreBridge

*The ATTO FibreBridge family of products provides Fibre Channel-to-SCSI bridges as standard PCI boards, stand alone enclosures that can be fitted for rack mount integration, or desktop units, depending on the model and your needs.*

Fibre Channel is a serial communications technology designed to transfer large amounts of data between a variety of hardware systems over long distances. It is a key technology for applications that require shared, high bandwidth access to storage.

Fibre Channel provides a logical point-to-point serial channel for the transfer of data between a buffer at a source device and a buffer at a destination device. It moves buffer contents from one port to another, without regard to the format or meaning of the data, so different upper level protocols are able to run over Fibre Channel hardware.

The Fibre Channel architecture is structured as a hierarchical set of protocol layers. Defined within these layers are rules for signal interfaces, serial encoding and decoding, error control, frame format and communications protocols.

All ATTO FibreBridge™ models can be used in a SAN (Storage Area Network) to connect a variety of Fibre Channel and SCSI devices to meet your needs.

A SAN is a shared storage architecture connecting computers and storage devices for online data access. Each connected system can directly access any attached storage device. Storage devices

could include RAID, tape backup, tape library, CD-ROM library or JBOD.

SANs maintain greater fault tolerance and load balancing by supporting server clustering and failover (the ability for one server to take over for another in the event of a failure).

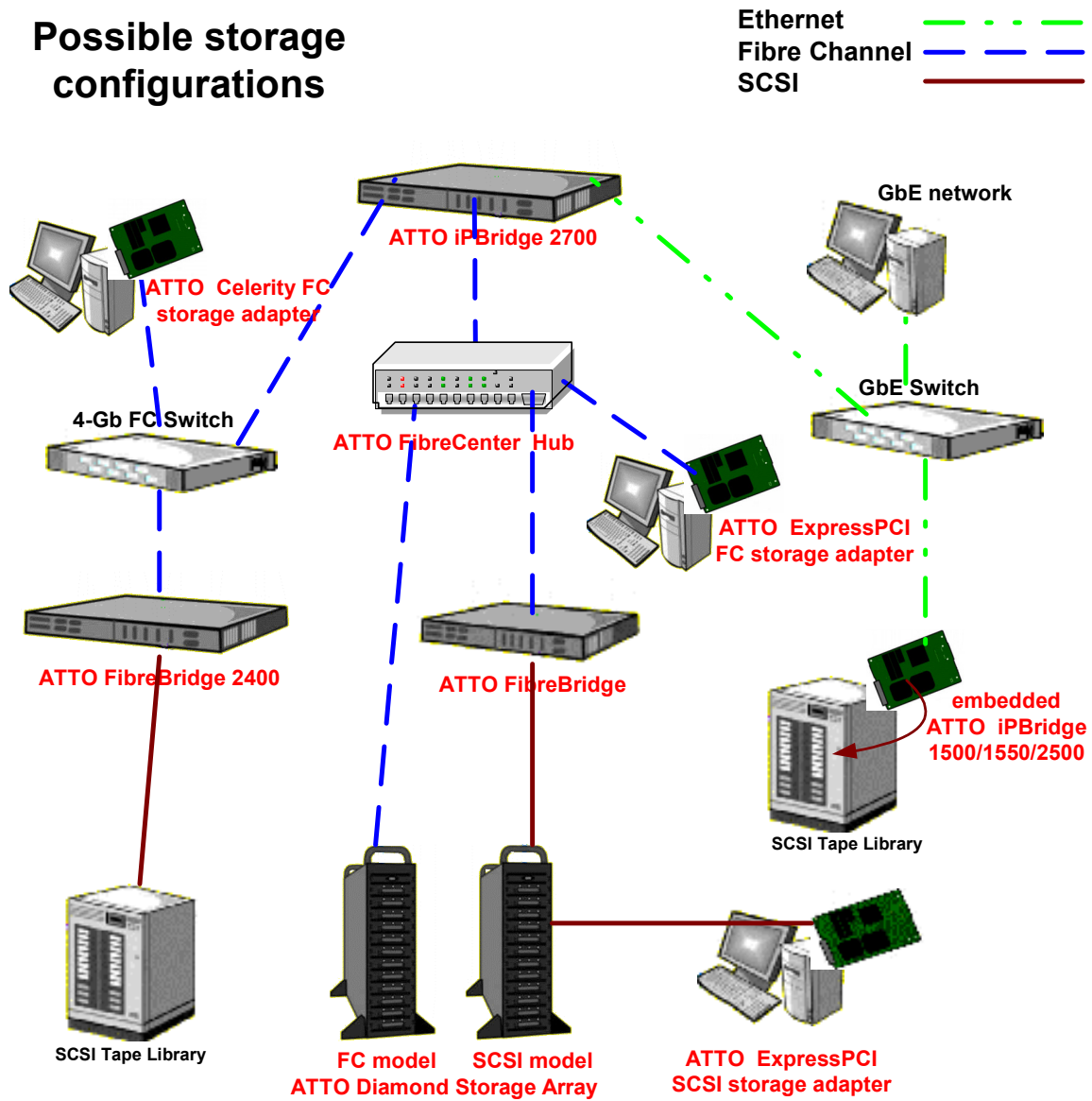
The ATTO FibreBridge provides the interface between SCSI and Fibre Channel resources in SANs. Possible configurations depend upon your current hardware and what you need to do.

The ATTO FibreBridge family of products shares common configuration options and functions to provide the most versatile connectivity options available. Each product has been engineered to address specific customer needs. New capabilities are integrated into products throughout the FibreBridge family as much as possible, requiring only an upgrade of firmware to incorporate them into your SAN (see [Updating firmware on page 79](#)). To make sure you have the most up-to-date version of the firmware, visit the ATTO Technology website, [www.attotech.com](http://www.attotech.com).

All ATTO FibreBridge models are operating system independent and include full duplex mode, Class 2 transfers and direct fabric connect capabilities.

Exhibit 1.0-1 A possible storage configuration.

## Possible storage configurations



# 1.1 Cabling

ATTO FibreBridge SCSI ports connect SCSI storage devices into the Fibre Channel Storage Area Network (SAN). Use an Ethernet connection to use the ATTO ExpressNAV interface (not available for the FibreBridge 1180).

Make sure all cables are anchored securely at both ends with the proper connectors.

## SCSI port connections

The FibreBridge supports a wide variety of SCSI storage devices including stand-alone drives, removable drives, JBODs, tape, CD and DVD drives, changers, libraries and magneto optical drives.

Each SCSI port is totally independent from the other SCSI port. Each bus may support up to 15 devices and each SCSI bus auto-negotiates the appropriate sync rates with the connected devices. If slower devices are mixed with faster devices, the bus will communicate at the rate of the slowest device.

Connect slower devices to one SCSI port and faster devices to the other port.

Connect a SCSI connector from the SCSI device to a SCSI port on the FibreBridge.

FibreBridge model	SCSI connector
1180	68-pin P
1290	VHDCI
2300	68-pin P
2350	VHDCI
2400	VHDCI
3300	68-pin P

Check the type of cable, cable length limit and number of devices recommended for each port.

Keep cable lengths as short as possible to ensure the highest signal quality and performance. These cable lengths include the wiring inside the devices.

Device type	Cable limit
Ultra SCSI Single Ended (SE)	1.5 meters
Ultra SCSI High Voltage Differential (HVD)	25 meters
Ultra2 SCSI Low Voltage Differential (LVD)	12 meters
Ultra3 SCSI Low Voltage Differential (LVD)	12 meters
Ultra4 SCSI Low Voltage Differential (LVD)	12 meters

## Fibre Channel connections

Fibre Channel technology offers a variety of cabling options. The type of cable required varies depending upon the application, environment and distance.

Cable length	Cable type	Cable size	Fibre Channel connector
Up to 175 meters	multi mode fiber optic	62.5 micron	LC
Up to 500 meters	multimode fiber optic	50 micron	LC
Up to 13 meters	unequalized copper		HSSDC-2

The type of connector depends on the FibreBridge model.

FibreBridge model	Fibre Channel connector
1180	MIA compliant DB-9 or Short Wave fiber optic SE connector
1290	copper or fiber interface SFP module
2300	copper or fiber interface SFP module
2350	copper or fiber interface SFP module
2400	copper or fiber interface SFP module
3300	copper or fiber interface SFP module

### **Serial port connections**

The ATTO FibreBridge supports remote service operations over the RS-232 serial port using standard terminal emulation software available with most systems.

Connect a DB-9 crossover serial cable (null modem) between the ATTO FibreBridge serial port and one of the computer's serial COM ports.

A gender changer or DB-9 to DB-25 converter may be needed depending on the cables being used.

### **Ethernet connections**

This section does not apply to the ATTO FibreBridge 1180.

The 10/100 BaseT Ethernet port provides remote monitoring and management using the ATTO ExpressNAV interface.

When you connect an Ethernet cable between the FibreBridge and a 10/100Base-T connection, you may need a crossover cable connecting directly to a computer. The ATTO FibreBridge will auto detect the Ethernet speed by default.

## 1.1.1 Using the Ethernet port

*The easiest way to communicate with the ATTO FibreBridge is to use the browser-based interface, ATTO ExpressNAV. Your FibreBridge must be recognized by the network by finding or assigning it an IP address. ATTO ExpressNAV is not available for the ATTO FibreBridge 1180.*

### FibreBridge 2400

The FibreBridge 2400 is set up by default to request an IP address from a DHCP server. If you do not have a DHCP server to assign IP addresses to devices, get an IP address from your network administrator and continue with the section [Other models \(except FB 1180, 2400\)](#)

When using DHCP, the QuickNAV utility, from the CD included with your FibreBridge, finds your FibreBridge on your network.

- 1 Work from the computer attached to the FibreBridge on the same broadcast domain. Find and download the QuickNAV utility, **QuickNAV-windows.exe**, from the CD included with your FibreBridge.
- 2 Turn on the FibreBridge.
- 3 Run the QuickNAV application.
  - a. Click **Next** on the QuickNAV **Wizard** page.
  - b. Select your FibreBridge serial number from the list of choices displayed.
  - c. Click **Next**.
  - d. Click **Launch Browser**.

Your browser will point to the ExpressNAV splash screen.

- 4 Enter the username and password values.



#### Note

*The default values are username: "root" and password: "Password". The username is case insensitive and the password is case sensitive.*



#### CAUTION

**It is best practice to change the default username and password after you have configured your FibreBridge. Refer to [Change the default username, password](#) on page 75.**

The FibreBridge **Status** page appears.

- 5 Go on to [Mapping](#) on page 67.

### Other models (except FB 1180, 2400)

You must set up the FibreBridge with an IP address supplied by your network manager. Use standard terminal emulation software and the CLI over the RS-232 serial port. Refer to [Using the serial port](#) on page 7.

- 1 Work from the computer attached to the FibreBridge serial port. After the **Ready** prompt is returned, start a terminal emulation program on the personal computer, and use it to connect to the FibreBridge.
  - a. For example, if you are using HyperTerminal on a computer running a Windows operating system, type **FibreBridge** in the **New Connection** dialog box. Then click **OK**.
  - b. In the **Connect To** dialog box, for the **Connect using** field select the COM port number to which your serial cable is connected. Then click **OK**.
  - c. In the **COM Properties** dialog box select the following values:
    - Bits per second: 9600
    - Data Bits: 8
    - Parity: None
    - Stop Bits: 1
    - Flow Control: None
    - Terminal type: ASCII
    - Echo: on
  - d. Click **OK**.
- 2 After you connect to the FibreBridge, you can see the start-up messages. The last line in the start-up message sequence is **Ready**. See Exhibit 1.1-3 on page 8.

In serial port sessions, there is no prompt on the line below the word **Ready**. Begin typing CLI commands in the blank line where the cursor is resting.

No username or password is required for serial port access.

CLI commands are case insensitive. You can type all upper or all lower case or a mixture. Upper and



lower case in this guide and the **help** screen are for clarification only.

- 3 To verify that you have connected successfully, type **help** after the **Ready** prompt and press **Enter**.

If a list of all available commands does not appear on the screen, review the steps in this section, check the cable, or contact service personnel until the problem is solved.

The Ethernet port IP address must be set by issuing a command from the serial port.

- 4 Connect the Ethernet port to your network switch.
- 5 Obtain appropriate IP addresses, gateways and subnet masks from your network administrator. The recommended configuration is one where DHCP has been disabled.

- 6 Issue the **set IPAddress** command. The default IP address for the Ethernet port is "**10.0.0.0**." The example below uses a hypothetical IP address from an internal network.

Ready.

```
set IPAddress 172.17.76.3
```

Press **Enter**.

- 7 After the **Ready** prompt is returned, issue the **set IPSubnetMask** and **set IPGateway** commands. The default subnet mask is "**255.255.0.0**;" there is no default gateway.
- 8 It is best practice to change the default username and password for world wide web, Telnet and FTP use. Refer to [Optional configurations](#) on page 75.
- 9 Continue configuration by mapping devices. Refer to [Mapping](#) on page 67.

## 1.1.2 Using the serial port

Use the serial port to connect to the FibreBridge 1180 and as an alternative method to connecting to other ATTO FibreBridge models over the Ethernet.



### Note

The recommended management tool for the all FibreBridge models except the FibreBridge 1180 is ATTO ExpressNAV through the Ethernet ports. Refer to [ATTO ExpressNAV interface](#) on page 31. The recommended management tool for the FibreBridge 1180 is BridgeTools. Refer to [ATTO BridgeTools for FB1180 only](#) on page 35.

The ATTO FibreBridge supports remote service operations over the RS-232 serial port using standard terminal emulation software available with most systems.

- 1 Connect a DB-9 crossover serial cable (null modem) between the ATTO FibreBridge serial port and one of the computer's serial COM ports.  
A gender changer or DB-9 to DB-25 converter may be needed depending on the cables being used.
- 2 Turn on the FibreBridge.
- 3 Start a terminal emulation program on the personal computer, and use it to connect to the FibreBridge. For example, if you are using HyperTerminal on a computer running a Windows operating system,
  - a. Type **FibreBridge** in the **New Connection** dialog box.
  - b. Click **OK**.
  - c. In the **Connect To** dialog box, for the **Connect using field** select the COM port number to which your serial cable is connected.
  - d. Click **OK**.
  - e. In the COM Properties dialog box select the following values:
    - 9600 bits per second for all models except the FibreBridge 2400 which is 115200 bps.

- Data Bits: 8
- Parity: None
- Stop Bits: 1
- Flow Control: None
- Terminal type: ASCII
- Echo: on

f. Click **OK**.

- 4 After you connect to the FibreBridge, start-up messages are displayed. The last line in the start-up message sequence is **Ready**. See the example in Exhibit 1.1-3.



### Note

In serial port sessions, there is no prompt on the line below the word **Ready**. Begin typing commands in the blank line where the cursor is resting.

No username or password is required for serial port access.

- 5 To verify that you have connected successfully, type **help** after the **Ready** prompt and press **Enter**.

If a list of all available commands does not appear on the screen, review the steps in this section, check the cable, or contact service personnel until the problem is solved.

If you have difficulty using the serial port, verify that you have the correct settings and that your serial cable is less than two meters in length.

After connecting using the serial port, you may set the Ethernet address for the FibreBridge, change the username and password, and use other interface options.

*Exhibit 1.1-3 Start up messages.*

```
      ATTO FibreBridge 1180
(c) 2004 ATTO Technology, Incorporated.

Firmware version 2.00 release date Jan 20 2004, 12:55:33 Build 013E

Power-On Self-Test Completion Status: GOOD
64 Megabytes of RAM Installed.

1 1.0624 Gb/s Fibre Channel Arbitrated Loop Interfaces.
1 LVD SCSI Interface Ports.

Interface 0 World Wide Name = 20 00 00 10 86 10 11 24

FibreBridge Serial Number = "FB1180E100034"
FibreBridge Name = "      "
ErrorLog Contents:  NO ERRORS
For help, type HELP.

Ready.
```

## 1.2 ATTO FibreBridge 1180D

*The ATTO FibreBridge 1180D is a 1 by 1 (one Fibre Channel port with one SCSI port) Fibre Channel-to-SCSI bridge for standard applications available in vertical or horizontal interface in a desktop version. The bridge is designed for high throughput enterprise environments and mission-critical applications.*

The form factor and low cost make the FibreBridge 1180D an attractive solution to convert SCSI devices to Fibre Channel and enable direct connection to Storage Area Networks (SANs).

- Serverless backup support for SNIA extended copy command
- Support for manual and auto LUN mapping
- Operating system independent

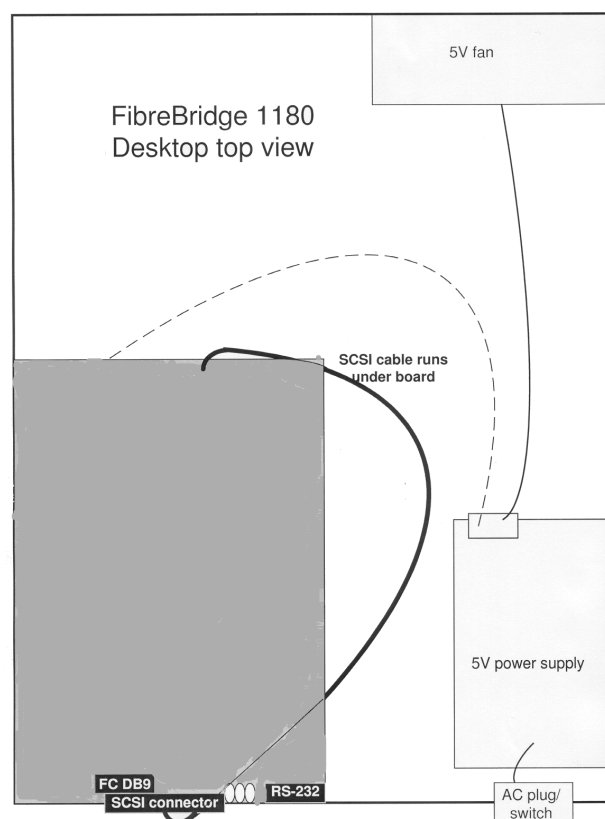
### Dimensions

Length: 10 in. (24.4 cm)

Width: 7.5 in. (19.05 cm)

Height: 2.03 in. (5.1 cm)

*Exhibit 1.2-1 FibreBridge 1180D internal schematic*



### Environmental requirements

Temperature: 0-40° C

Ambient air should not exceed 40°C.

Humidity 10-90% non-condensing

### Cooling

A fan draws air at 10 CFM from the back and sides of the unit and exhausts it out the front and through the unit's bottom panel.

### Power

Input is 100/240 V~.75/.35A, 50/60Hz. An IEC 320 AC power connector and switch are located on the back of the unit.

**Applying power:** Insert supplied AC cord into unit. Plug cord into outlet.

### Fibre Channel port

The Fibre Channel port can connect the FibreBridge to either a Fabric or Arbitrated Loop.

- 1.0625 gigahertz (80 MB/sec.)
- Class 2 and Class 3 ANSI Fibre Channel specifications support
- PLDA, Public Loop Login (NL\_port) and Fabric Direct Connect (N\_port) support
- Full Duplex transmission support
- MIA compliant DB-9 or Short Wave fiber optic SE connector

### SCSI port

The SCSI port on the FibreBridge 1180E/D connects storage devices into the Fibre Channel Storage Area Network (SAN) using an Ultra 2 (LVD) SCSI bus, downward compatible with all forms of single-ended SCSI.

## Serial port

The RS-232 serial port provides support for remote monitoring and management through a command line interface, menu system or graphical interface (ATTO Technology BridgeTools).

## LED indicators

**FC Activity:** LED blinks to show activity on the Fibre Channel port (numbered 0). During very high activity, the LED appears to be steadily lit.

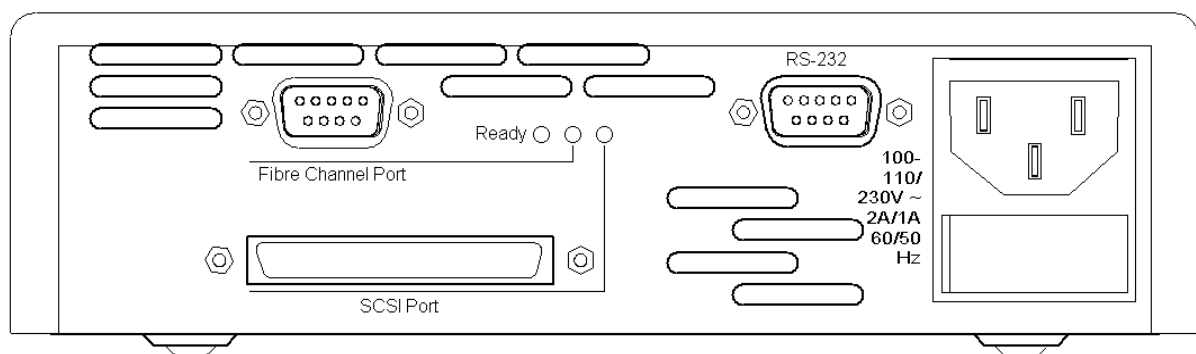
**SCSI Activity:** shows activity on the SCSI bus (numbered 0).

**Ready:** should light after power has been applied; indicates the board has completed the initialization process without any failures and is ready to handle data transfer.

## Installation instructions

- 1 Physically place the FibreBridge on a desktop or mount in a rack. To mount in a rack
  - a. Attach "L" brackets so that the front side with the LEDs faces front and the connector side is at the back.
  - b. Install the FibreBridge horizontally within the rack so it does not reduce the air flow within the rack.
  - c. Properly ground the FibreBridge to the rack equipment. The earth ground connection must be maintained.The power requirements plus the power draw of the other equipment in the rack must not overload the supply circuit and/or wiring of the rack.
- 2 Connect a SCSI device to the FibreBridge. Connect the FibreBridge to your SAN: attach short wave optical cables or MIA compliant DB-9 connectors into the Fibre Channel port on the FibreBridge. Connect to the management (services) port via the RS-232 serial port. Refer to [Cabling](#) on page 3.
- 3 Connect the power connector.
- 4 Apply power.
- 5 Use ATTO BridgeTools, a graphical interface utility enclosed with your FibreBridge, to connect to FibreBridge Services. (Refer to [ATTO BridgeTools for FB1180 only](#) on page 35).
- 6 Map your devices to the FibreBridge Fibre Channel port. (Refer to [Mapping](#) on page 67).
- 7 Boot the computers on the SAN and, if necessary, set up the configuration for the devices connected to the FibreBridge using ATTO BridgeTools and the information in the following chapters.

Exhibit 1.2-2 FibreBridge 1180D back panel



## 1.3 ATTO FibreBridge 1180E

*The ATTO FibreBridge 1180E is a 1 by 1 (one Fibre Channel port with one SCSI port) Fibre Channel-to-SCSI bridge for standard applications available in vertical or horizontal interface in the embedded version. The bridge is designed for high throughput enterprise environments and mission-critical applications.*

The form factor and low cost make the FibreBridge 1180E an attractive solution to convert SCSI devices to Fibre Channel and enable direct connection to Storage Area Networks (SANs).

- Serverless backup support for SNIA extended copy command
- Support for manual and auto LUN mapping
- Operating system independent

### Board dimensions

Length: 5.59 in. (14.2 cm)

Width: 3.89 in. (9.9 cm)

### Environmental requirements

Temperature: 0-40° C

Ambient air should not exceed 40°C.

Humidity: 10-90% non-condensing

### Power

Power (+5VDC and +12VDC) is supplied through a standard 4-pin connector: Amp Part no 641737-1. The 1180E is designed to have 5% tolerance to the power supply. A switching regulator generates the 3.3 VDC from the 12 VDC, requiring 0.75A at 12VDC

### Fibre Channel port

The Fibre Channel port can connect the FibreBridge to either a Fabric or Arbitrated Loop.

- 1.0625 gigahertz (80 MB/sec.)
- Class 2 and Class 3 ANSI Fibre Channel specifications support
- PLDA, Public Loop Login (NL\_port) and Fabric Direct Connect (N\_port) support
- Full Duplex transmission support
- MIA compliant DB-9 or Short Wave fiber optic SE connector

### SCSI port

The SCSI port on the FibreBridge 1180E connects storage devices into the Fibre Channel Storage Area Network (SAN) using an Ultra 2 (LVD) SCSI bus, downward compatible with all forms of single-ended SCSI.

### Serial port

The RS-232 serial port provides support for remote monitoring and management through a command line interface, menu system or graphical interface (ATTO Technology BridgeTools).

Pin	Signal	
1	DCD	Carrier Detect
2	DSR	Data Set Ready
3	RX	Receive Data
4	RTS	Request to send
5	TX	Transmit Data
6	CTS	Clear to Send
7	NC	No Connect
8	NC	No Connect
9	GND	Ground
10	NC	No Connect

### LED indicators

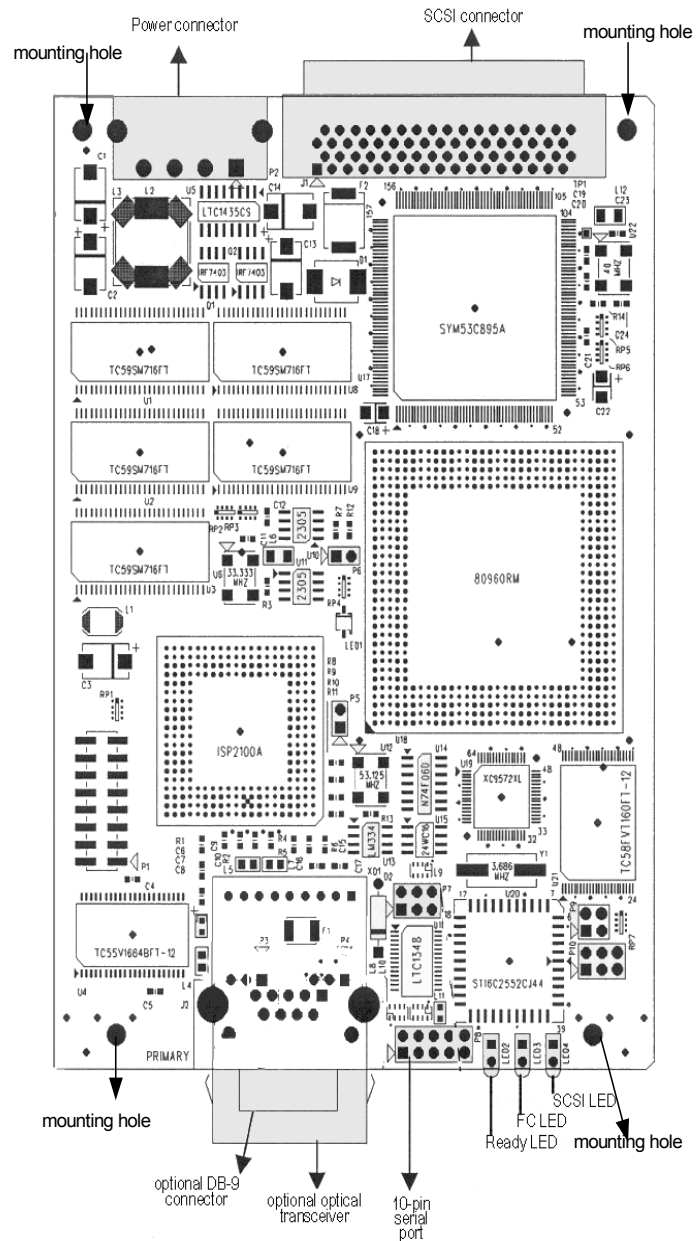
**FC Activity:** LED blinks to show activity on the Fibre Channel port. During very high activity, the LED appears to be steadily lit.

**SCSI Activity:** shows activity on the SCSI bus.

**Ready:** lights after power has been applied; indicates the board has completed the initialization process without errors.

# Installation instructions

- 1 Mount the FibreBridge in your device.
- 2 Connect a SCSI device to the FibreBridge. Connect the Fibre Channel port to your SAN. Connect the Ethernet cable from the Fibre Bridge to your computer. Refer to [Cabling](#) on page 3.
- 3 Connect the power connector.
- 4 Apply power.
- 5 Access FibreBridge Services using the QuickNAV utility. Refer to [Configuring the FibreBridge](#) on page 64.
- 6 Go to the ExpressNAV **Restart** page and restart the FibreBridge.
- 7 Map your devices. Refer to [Mapping](#) on page 67.
- 8 Boot the computers on the SAN and check the configuration. Refer to [Additional configurations](#) on page 17.



## 1.4 ATTO FibreBridge 1290E

*The ATTO FibreBridge 1290E is a 2-Gigabit 1 x 2 (one Fibre Channel port with two SCSI ports) Fibre Channel to SCSI bridge for high throughput enterprise environments designed for mission-critical applications.*

The FibreBridge 1290E features a small form factor for standard embedded applications such as tape drives, hard disk drives and other SCSI devices and includes serverless backup support and support for manual and auto LUN mapping. It auto negotiates 1- or 2-Gb/sec. Fibre Channel data rate.

### Board dimensions

- Width: 4.2 inches
- Length: 7.6 inches

### Environmental requirements

- 0-40° C operating temperature
- Ambient air should not exceed 70°C
- 10-90% humidity non-condensing

### Power

Power is supplied to the FibreBridge 1290E through an external universal PCI connector controlled by two heavy duty jumpers placed in the power selector holes. (see board diagram in Exhibit 1.4-1)

**PCI connector (default)** A switching regulator generates +3.3V from +5V which will also be used to supply term power for the SCSI busses. Place a heavy duty jumper between holes JMP 4 and JMP 3 and another heavy duty jumper between holes JMP 6 and JMP 5.

**6-pin connector** Requires +12V and +5V. A switching regulator generates +3.3V from +12V; +5V supplies power for the SCSI buses. Place a heavy duty jumper between holes JMP 1 and JMP 3 and another heavy duty jumper between holes JMP 2 and JMP 5.

### Fibre Channel port

The Fibre Channel port can connect the FibreBridge to either a Fabric or Arbitrated Loop

using a copper or optical SFP module.

Characteristics include

- 2.125 Gb/sec. (200 MB/sec.)
- Class 2, Class 3 and ANSI Fibre Channel specifications support
- PLDA, Public Loop Login (NL\_port) and Fabric Direct Connect (N\_port) support
- Full Duplex transmission support

### SCSI ports

The two SCSI ports use a dual VHDCI connector to connect storage devices into the Fibre Channel Storage Area Network (SAN). Each port is totally independent from the other and located on the same edge of the board as the Fibre Channel connector.

The FibreBridge 1290E SCSI port is an Ultra 3 (LVD) SCSI with 160 MB/sec. maximum data transfer rate per bus, downward compatible with all forms of single-ended SCSI.

### Serial port header

The RS-232 serial port provides support for remote monitoring and management through a command line interface or the menu system.

Pin	Signal
3	RX (Receive Data)
5	TX (Transmit Data)
9	GND (Ground)

### Ethernet port

The 10/100 Base T Ethernet port supports SNMP, FTP- and Telnet-based monitoring and management through a command line interface or menu system. The RJ45 connector is on the faceplate.



## LED indicators

The faceplate shows two dual-stacked LEDs and a single LED. The green dual-stacked LED indicates FC activity, the other FC link speed. Another green dual-stacked LED indicates SCSI activity on each of the SCSI ports, and the single LED indicates **Ready** status.

**FC Activity:** The LED blinks to show activity on the Fibre Channel port (numbered 0). During very

high activity, the LED may appear to be steadily lit.

**FC Link Speed:** a lit LED indicates the FibreBridge is using 2-Gigabit.

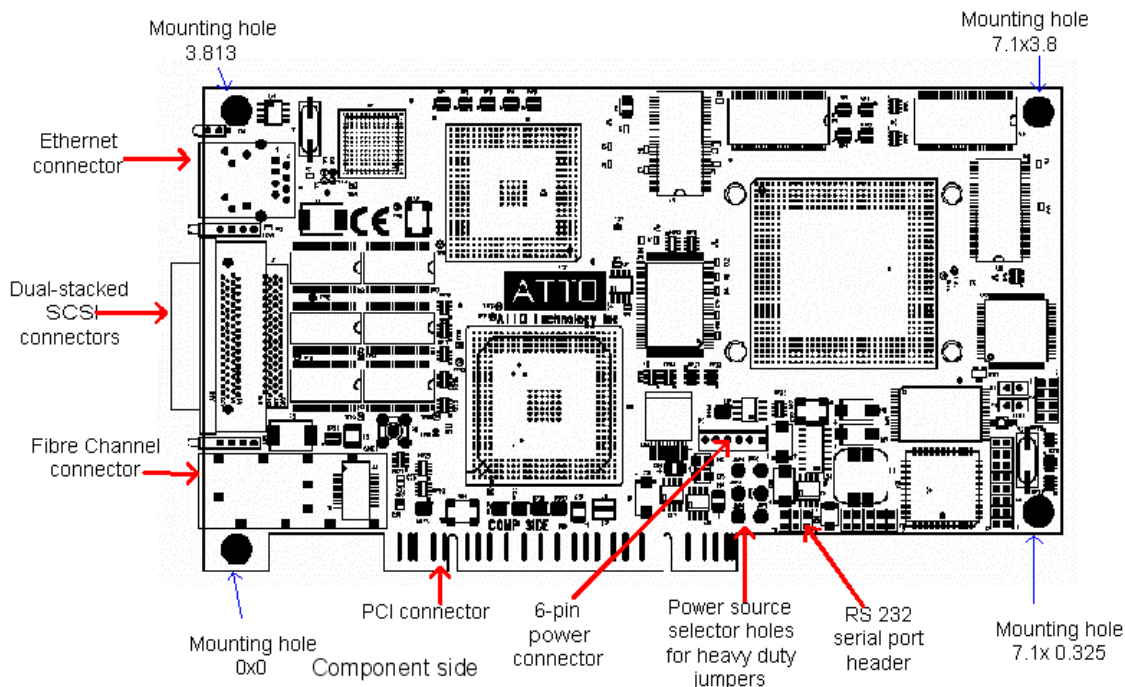
**SCSI Activity:** shows activity on the SCSI bus (numbered 0 and 1).

**Ready:** should light after power has been applied to indicate the board has completed the initialization process without any failures and is ready to handle data transfers.

## Installation instructions

- 1 Mount the FibreBridge in your device.
- 2 Connect a SCSI device to the FibreBridge. Connect the Fibre Channel port to your SAN. Connect the Ethernet cable from the Fibre Bridge to your computer. Refer to [Cabling](#) on page 3.
- 3 Connect the power connector.
- 4 Apply power.
- 5 Access FibreBridge Services using the QuickNAV utility. Refer to [Configuring the FibreBridge](#) on page 64.
- 6 Go to the ExpressNAV **Restart** page and restart the FibreBridge.
- 7 Map your devices. Refer to [Mapping](#) on page 67.
- 8 Boot the computers on the SAN and check the configuration. Refer to [Additional configurations](#) on page 17.

*Exhibit 1.4-1 Board layout showing mounting holes and connectors.*



## 1.5 ATTO FibreBridge 2300R/D

*The ATTO FibreBridge 2300R/D is a 2-Gigabit Fibre Channel to SCSI bridge for midrange high performance, cost effective solutions in enterprise environments.*

The FibreBridge 2300 includes one Fibre Channel port and two SCSI ports. The desktop version comes with attached feet for desktop use and mounting brackets to convert to standard 19-inch enclosures.

### Dimensions

Width: 16.91 inches wide (42.95 cm)  
Depth: 10 inches deep (25.4 cm)  
Height: 1.72 inches high (4.32 cm) (1U)  
Weight: approximately 10 pounds

### Cooling and airflow

Operating Temperature: 5-40° C external  
Humidity: 10-90% non-condensing

Air enters from the front and is exhausted out the connector side by a blower inside the enclosure which provides 11 cubic feet per minute of airflow. Ambient air near the inlets should not exceed 40°C. The unit will automatically stop operation if the temperature goes beyond this threshold.



### CAUTION

**Do not block the enclosure's vents. The FibreBridge will shut down if overheating occurs.**

### Power

The power supply circuit is permanently mounted within the enclosure and is not hot swappable. It has one standard IEC320 power receptacle and switch.

The universal power supply provides power for the bridge board and cooling fan.

The power requirements of the ATTO FibreBridge 2300R plus the power draw of the other equipment in the rack must not overload the supply circuit and/or wiring of the rack.

Input voltage: 110/230V AC, with operating input range of 90-132V AC or 175-264V AC, 47-63Hz, single phase. The AC input range selection is automatic with no manual or jumper switchover required.

Power draw is 2 amps at 110V, 1.6 amps @ 90V

### Fibre Channel port

The single 2-Gigabit Fibre Channel port can connect the FibreBridge to either a Fabric or Arbitrated Loop.

- 2.125 Gigabit/sec.
- Class 2, Class 3 and ANSI Fibre Channel specifications support
- PLDA, Public Loop Login (NL\_port) and Fabric Direct Connect (N\_port) support
- Full Duplex transmission support
- Small Formfactor Pluggable (SFP) interface
- Backward compatible with 1.0625 gigabit/sec. devices

### SCSI ports

The two SCSI ports on the FibreBridge 2300 connect storage devices into the Fibre Channel Storage Area Network (SAN). Each port is totally independent from the other.

The ports are Ultra 3 LVD/SE SCSI busses with 68-pin "P" interface: 160 MB/sec. max throughput, downward compatible with all forms of single-ended SCSI.

### Ethernet port

The 10/100 Base T Ethernet port assessable from the RJ45 connector supports SNMP- and Telnet-based monitoring and management through a command line interface, menu system or ATTO ExpressNAV.

## Serial port

The RS-232 serial port provides support for remote monitoring and management through a command line interface or menu system.

## LED indicators

The LED indicators can be viewed from both the front and the back of the FibreBridge 2300R/D.

**Power:** indicates if power is available from the supply.

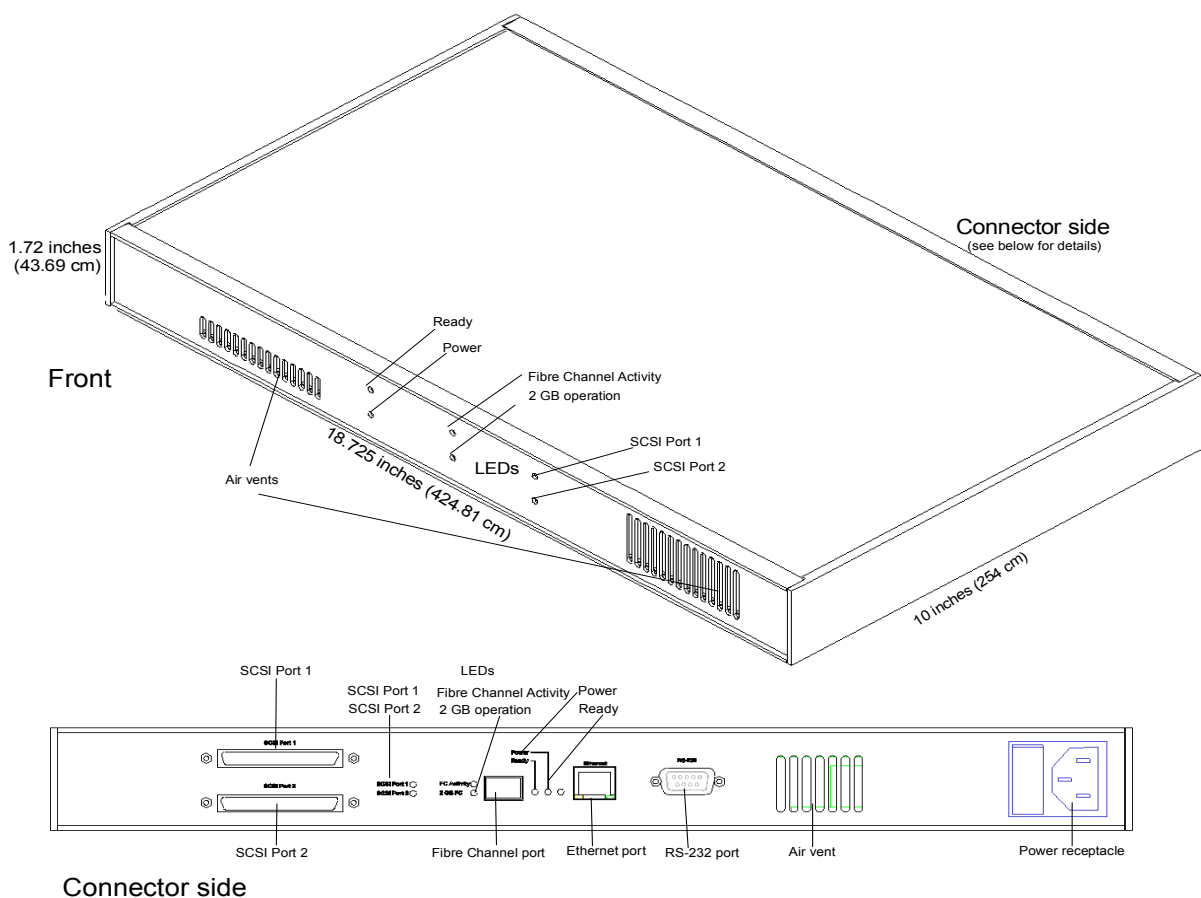
**FC Activity:** LED blinks to show activity on the Fibre Channel port (numbered 0). During very high activity, the LEDs appear to be steadily lit.

**2 Gigabit operation:** a lit LED indicates the FibreBridge is using 2 Gigabit.

**SCSI 0 Activity, SCSI 1 Activity:** each SCSI bus has its own LED to show activity on that bus (numbered 0 and 1).

**Ready:** should light after power has been applied indicating the FibreBridge is ready to operate.

Exhibit 1.5-1 Physical characteristics



# Installation instructions

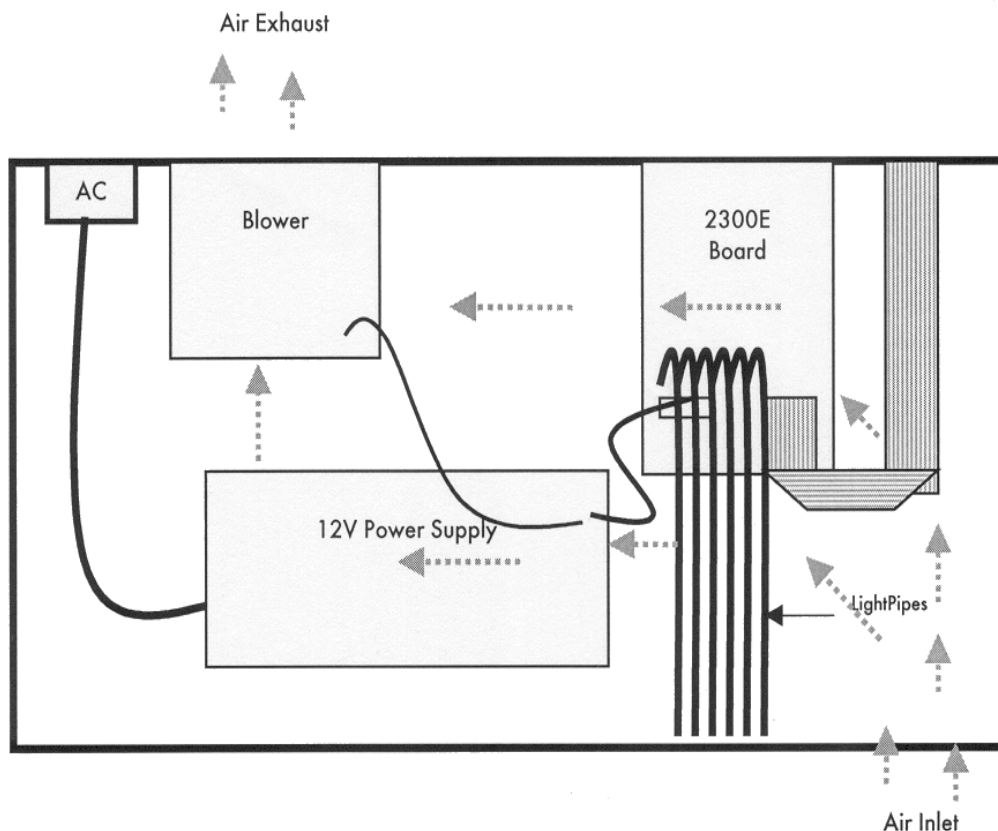
- 1 Physically place the FibreBridge on a desktop or into a rack.
  - a. To mount on a rack, install “L” brackets so that either the front or the connector side of the FibreBridge faces front. The mounting holes on the bracket fit a standard 19-inch rack using a centered 1.25-inch (31.7 mm) hole pattern.
  - b. Install the FibreBridge horizontally within the rack so it does not reduce the air flow.
- c. Properly ground the FibreBridge to the rack equipment. The earth ground connection must be maintained.
- 2 Connect a SCSI device to the FibreBridge. Connect the Fibre Channel port to your SAN. Connect the Ethernet cable from the Fibre Bridge to your computer. Refer to [Cabling](#) on page 3.
- 3 Connect the power connector.
- 4 Apply power.
- 5 Access FibreBridge Services using the QuickNAV utility. Refer to [Configuring the FibreBridge](#) on page 64.
- 6 Go to the ExpressNAV **Restart** page and restart the FibreBridge.
- 7 Map your devices. Refer to [Mapping](#) on page 67.
- 8 Boot the computers on the SAN and check the configuration. Refer to [Additional configurations](#) on page 17.



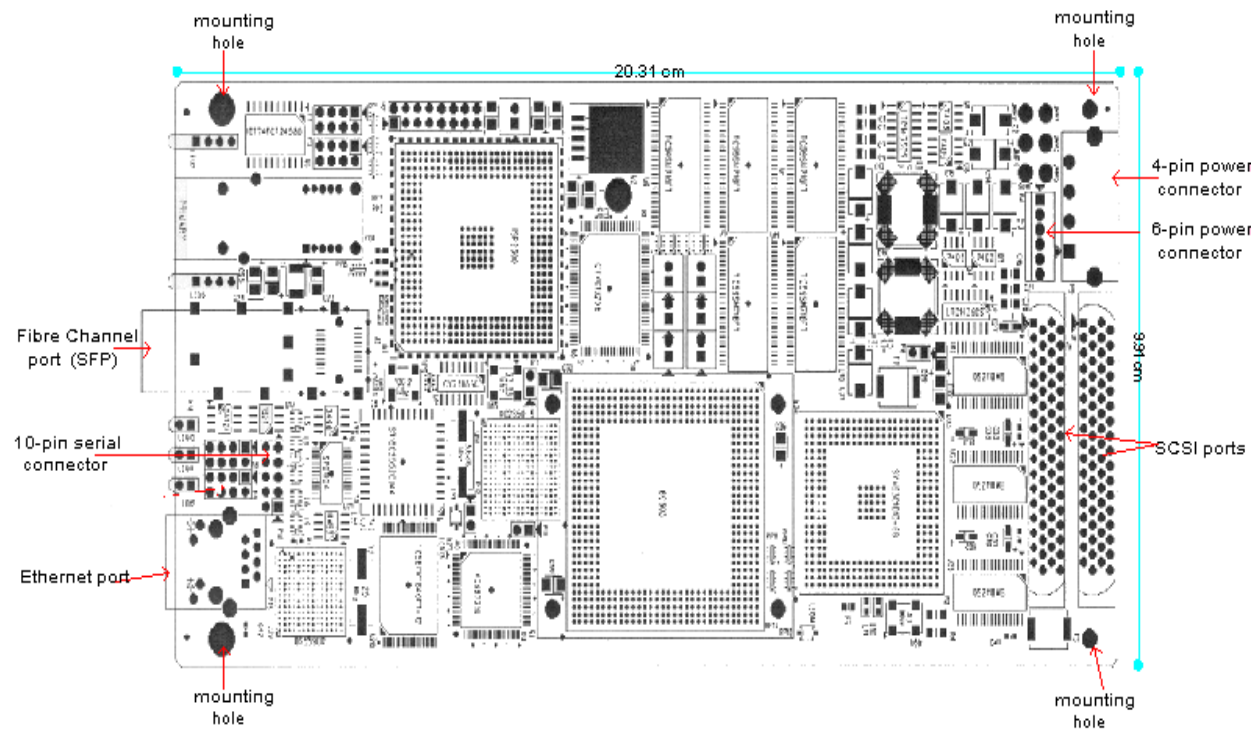
## Note

*The power requirements of the ATTO FibreBridge plus the power draw of the other equipment in the rack must not overload the supply circuit and/or wiring of the rack.*

Exhibit 1.5-2 FibreBridge 2300R/D schematic: top view



*Exhibit 1.5-3 FibreBridge 2300 board layout*



## 1.6 ATTO FibreBridge 2300E

*The ATTO FibreBridge 2300E is a 2-Gigabit Fibre Channel to SCSI bridge which can be embedded in a variety of enclosures for midrange high performance, cost effective solutions in enterprise environments.*

The the 2-Gigabit FibreBridge 2300E includes one Fibre Channel port and two SCSI ports and conforms to the width of the standard 3.5-inch drive form factor. ATTO Technology FibreBridge software executes from the Intel 80303, an integrated I960JT processor and PCI-PCI bridge.

- 128 MB SDRAM, capable of 800 MB/sec.
- Qlogic ISP2300 Fibre Channel controller with a copper or optical SFP module interface.
- LSI 53C1010 SCSI controller provides interface with two Ultra 3 SCSI buses.
- Ethernet interface is a 10/100Base T implemented with an Intel 82559ER Ethernet controller accessible from the RJ45 connector.

### Board dimensions

Width: 3.9 inches wide (9.91 cm)

Length: 7.995 inches long (20.31 cm)

### Cooling and airflow

Operating Temperature: 5-40° C

Humidity: 10-90% non-condensing

### Power

The drive power connector (18 watts) allows the FibreBridge 2300E to draw power from a standard 12/5V drive.

### Fibre Channel port

The single 2-Gigabit Fibre Channel port can connect the FibreBridge to either a Fabric or Arbitrated Loop.

- 2.125 gigabit/sec.
- Class 2, Class 3 and ANSI Fibre Channel specifications support
- PLDA, Public Loop Login (NL\_port) and Fabric Direct Connect (N\_port) support
- Full Duplex transmission support
- Small Formfactor Pluggable (SFP) interface
- Backward compatible with 1.0625 gigabit/sec. devices

### SCSI ports

The two SCSI ports on the FibreBridge 2300 connect storage devices into the Fibre Channel Storage Area Network (SAN). Each port is totally independent from the other.

The ports are Ultra 3 LVD/SE SCSI busses with 68-pin “P” interface: 160 MB/sec. max throughput, downward compatible with all forms of single-ended SCSI.

### Ethernet port

The 10/100 Base T Ethernet port assessable from the RJ45 connector supports SNMP- and Telnet-based monitoring and management through a command line interface, menu system or ATTO ExpressNAV.

### Serial interface

The 10-pin serial connector provides remote monitoring and management through a command line interface or the menu system

### LED indicators

An LED header provides support for light pipes to allow LEDs to be run to either side of the FibreBridge 2300E board.

**Power:** indicates if power is available from the supply.

**FC Activity:** LED blinks to show activity on the Fibre Channel port (numbered 0). During very high activity, the LEDs appear to be steadily lit.

**2 Gigabit operation:** a lit LED indicates the FibreBridge is using 2 Gigabit.

**SCSI 0 Activity, SCSI 1 Activity:** each SCSI bus has its own LED to show activity on that bus (numbered 0 and 1).

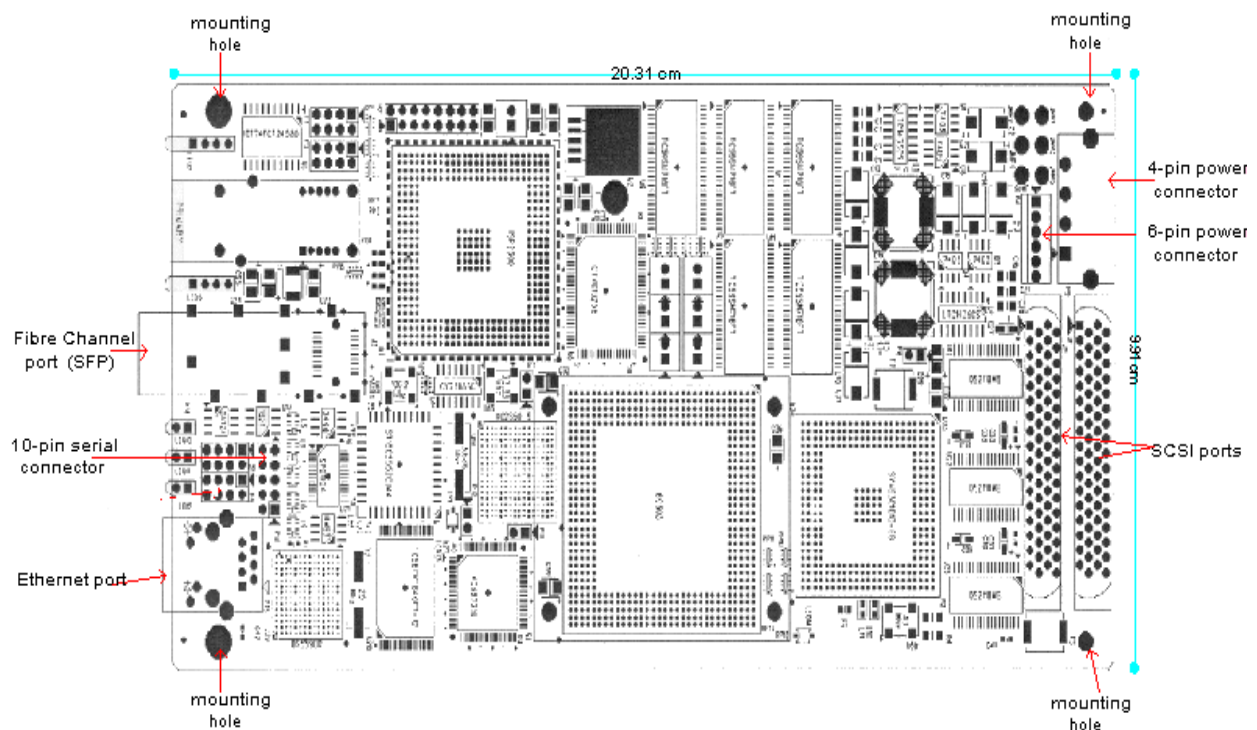
**Ready:** should light after power has been applied indicating the FibreBridge is ready to operate.



# Installation instructions

- 1 Mount the FibreBridge in your device.
- 2 Connect a SCSI device to the FibreBridge. Connect the Fibre Channel port to your SAN. Connect the Ethernet cable from the Fibre Bridge to your computer. Refer to [Cabling](#) on page 3.
- 3 Connect the power connector.
- 4 Apply power.
- 5 Access FibreBridge Services using the QuickNAV utility. Refer to [Configuring the FibreBridge](#) on page 64.
- 6 Go to the ExpressNAV **Restart** page and restart the FibreBridge.
- 7 Map your devices. Refer to [Mapping](#) on page 67.
- 8 Boot the computers on the SAN and check the configuration. Refer to [Additional configurations](#) on page 17.

Exhibit 1.6-1 FibreBridge 2300E board layout



## 1.7 ATTO FibreBridge 2350C

*The ATTO FibreBridge 2350C is a 2-Gigabit Fibre Channel-to- SCSI bridge configured with one Fibre Channel port and two independent SCSI busses (1x2) designed to integrate industry leading performance and Storage Area Network (SAN) capabilities into midrange and enterprise-level storage systems. It includes battery backed up memory, verbose trace log capabilities and date/time stamp.*

The 2-Gigabit FibreBridge 2350C includes one Fibre Channel port and two SCSI ports and conforms to the height of four standard rack units (4U of cPCI form factor). ATTO Technology FibreBridge software executes from the Intel 80303, an integrated I960JT processor and PCI-PCI bridge.

- 128 MB SDRAM, capable of 800 MB/sec.
- Local diagnostics supported through SNMP, Telnet, FTP and SCSI Enclosure Services (SES)
- Command line ASCII text management access via Ethernet, serial connection or In-band Fibre Channel link.
- Integrated ATTO ExpressNAV user management console for remote configuration, management and diagnostic capabilities

### Board dimensions

Width: 6.193"

Length: 6.299"

### Cooling and airflow

Operating temperature: 0 - 50° Celsius ambient  
Humidity: 10-85% non condensing during operation; 5-95% non condensing when not in operation

Airflow: 10.0 minimum cubic feet/min.

### Power

A cPCI connector or a custom 6-pin connector through a Hot Swap controller circuit and generates +3.3V via a switching regulator which generates +2.5V through a linear regulator. Current draw for a +5V input is 4.0A.

The auto recharging battery backs up event log RAM and assures data retention for 30 days without host power. The battery, shipped from the factory fully charged, is automatically recharged when power is restored to the system. It may take up to 1.5 days to charge the battery.

### SCSI ports

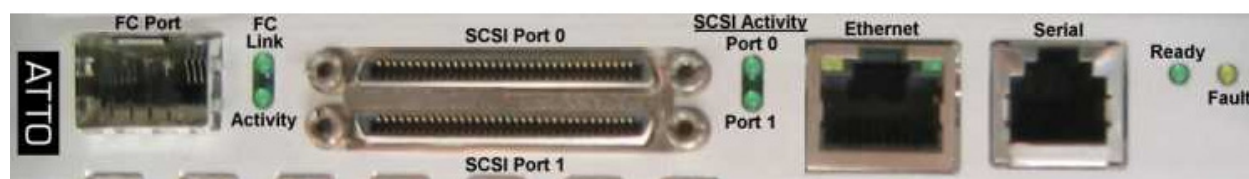
The LSI 53C1010 SCSI controller provides interface with two Ultra 3 LVD SCSI busses. They connect storage devices into the Fibre Channel Storage Area Network (SAN). Each port is totally independent from the other.

Dual VHDCI 68-pin SCSI connectors on the board's faceplate allow up to 15 devices per channel and are downward compatible with all forms of single-ended SCSI.

### Fibre Channel port

The single 2-Gigabit Fibre Channel port connects the FibreBridge to either a Fabric or Arbitrated Loop.

- Qlogic ISP2310 Fibre Channel controller with a copper or optical SFP module interface.
- 2.125 gigabit/sec.
- Class 2, Class 3 and ANSI Fibre Channel specifications support
- PLDA, Public Loop Login (NL\_port) and Fabric Direct Connect (N\_port) support
- Full Duplex transmission support
- Operating system independent
- Supports all SCSI devices including hard disk drives, tape drives, RAID controllers, DVD, MO & CD libraries





- Backward compatible with 1.0625 GB/sec. devices

## Ethernet port

The 10/100 BaseT Ethernet port, accessible from the RJ45 connector, located on the board's faceplate, is implemented with an Intel 82559ER controller. The Ethernet interface supports SNMP- and Telnet-based monitoring and management through a command line interface or an integrated user management console (ATTO ExpressNAV).

## Serial interface

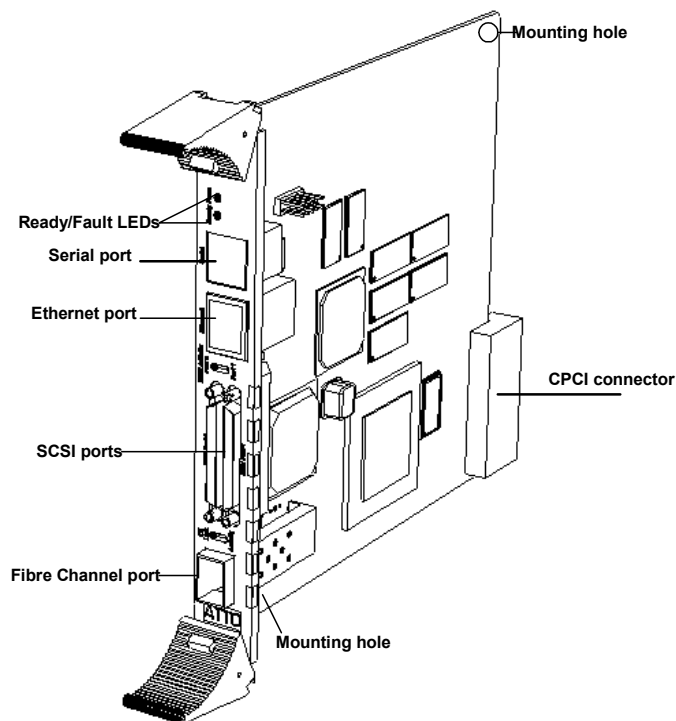
An RS-232 port accessible through an RJ11 connection on the front panel provides support for remote monitoring and management through a command line interface.

## LED indicators

Eight LEDs will be visible through the board faceplate: two dual-stacked LEDs, two single LEDs and two LEDs integrated into the RJ45 connector.

**FC Activity:** One set of dual-stacked LEDs will show Fibre Channel activity and Fibre Channel link status. During very high activity, the LEDs appear to be steadily lit.

**SCSI 0 Activity, SCSI 1 Activity:** The other set of dual-stacked LEDs shows the activity on each SCSI bus (numbered 0 and 1).



**Board status:** a single green LED will indicate Ready status while another LED will denote a fault status.

**LAN status:** the green LED integrated into the RJ45 connector will indicate LAN link status; the yellow LED will denote LAN activity.

**Power:** A surface-mounted LED on the board and not visible through the faceplate indicates the board has power.

## Installation instructions

- 1 Mount the FibreBridge in your device.
- 2 Connect a SCSI device to the FibreBridge. Connect the Fibre Channel port to your SAN. Connect the Ethernet cable from the Fibre Bridge to your computer. Refer to [Cabling](#) on page 3.
- 3 Connect the power connector.
- 4 Apply power.
- 5 Access FibreBridge Services using the QuickNAV utility. Refer to [Configuring the FibreBridge](#) on page 64.
- 6 Go to the ExpressNAV **Restart** page and restart the FibreBridge.
- 7 Map your devices. Refer to [Mapping](#) on page 67.
- 8 Boot the computers on the SAN and check the configuration. Refer to [Additional configurations](#) on page 17

## 1.8 ATTO FibreBridge 2400R/D

*The ATTO FibreBridge 2400R/D is a 4-Gigabit Fibre Channel to SCSI bridge which can be embedded in a variety of enclosures to integrate industry-leading performance and SAN capabilities into future generation storage solutions.*

The the 4-Gigabit FibreBridge 2400R/D includes two independent 4-Gigabit Fibre Channel ports and independent dual-stacked SCSI ports and is available in an industry-standard 4U cPCI form factor. The FibreBridge 2400 auto negotiates to 1, 2 and 4-Gigabit Fibre Channel.

### Dimensions

Width: 17 inches

Length: 11 inches

Height: 1.7 inches (1U)

Weight: approximately 10 pounds

### Cooling and airflow

Operating Temperature: 0-40° C external

Humidity: 10-90% non-condensing

Air enters from the front and is exhausted out the connector side by a blower inside the enclosure which provides 11 cubic feet per minute of airflow. Ambient air near the inlets should not exceed 40°C. The unit will automatically stop operation if the temperature goes beyond this threshold.



### CAUTION

**Do not block the enclosure's vents. The FibreBridge will shut down if overheating occurs.**

### Power

The power supply circuit is permanently mounted within the enclosure and is not hot swappable. It has one standard IEC320 power receptacle and switch.

The universal power supply provides power for the bridge board and cooling fan.

The power requirements of the ATTO FibreBridge 2400R plus the power draw of the other equipment in the rack must not overload the supply circuit and/or wiring of the rack.

Input voltage: 110/230V AC, with operating input range of 90-132V AC or 175-264V AC, 47-63Hz, single phase. The AC input range selection is automatic with no manual or jumper switchover required.

Power draw is 2 amps at 110V, 1.6 amps @ 90V

### Fibre Channel port

The dual independent 4-Gigabit Fibre Channel ports can connect the FibreBridge to either a Fabric or Arbitrated Loop.

- Full support for full duplex FC data transfers, FC-AL, PLDA and public loop login.
- Small Formfactor Pluggable (SFP) interface
- Auto negotiates with 1-, 2- and 4-Gb/sec. devices

### SCSI ports

The two SCSI ports connect storage devices into the Fibre Channel Storage Area Network (SAN). Each port is totally independent from the other.

The ports are Ultra 320 SCSI busses with VHDCI connector, downward compatible with all forms of single-ended SCSI and all previous SCSI protocols.

### Ethernet port

The 10/100 Base T Ethernet port is accessible from the RJ45 connector. Local diagnostics are supported through an integrated web server (ATTO ExpressNAV), CLI, SNMP, Telnet and FTP. Includes support for DHCP, Telnet, FTP, ICMP and SNMP.

### Serial interface

The 10-pin serial connector provides remote monitoring and management through a command line interface or the menu system

## LED indicators

An LED header provides support for light pipes to allow LEDs to be run to either side of the FibreBridge 2400R/D.

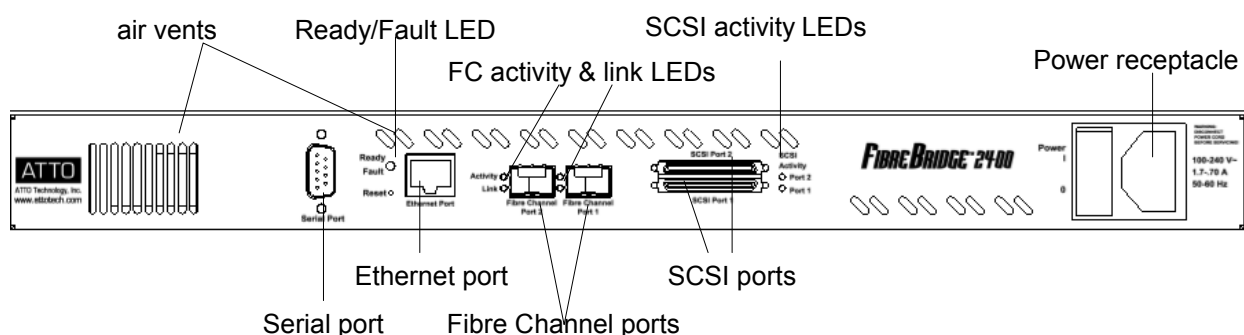
**Power:** indicates if power is available from the supply.

**FC 1 and FC 2 Activity:** LEDs blink to show activity on the Fibre Channel ports (numbered 1 and 2). During very high activity, the LEDs appear to be steadily lit.

**SCSI 1 Activity, SCSI 2 Activity:** each SCSI bus has its own LED to show activity on that bus (numbered 1 and 2).

**Ready:** should light after power has been applied indicating the FibreBridge is ready to operate.

Exhibit 1.8-1 Connectors, LEDs and power receptacle



## Installation instructions

- 1 Physically place the FibreBridge on a desktop or into a rack.
  - a. To mount on a rack, install "L" brackets so that either the front or the connector side of the FibreBridge faces front. The mounting holes on the bracket fit a standard 19-inch rack using a centered 1.25-inch (31.7 mm) hole pattern.
  - b. Install the FibreBridge horizontally within the rack so it does not reduce the air flow.
  - c. Properly ground the FibreBridge to the rack equipment. The earth ground connection must be maintained.
- 2 Connect a SCSI device to the FibreBridge. Connect the Fibre Channel port to your SAN. Connect the Ethernet cable from the Fibre Bridge to your computer. Refer to [Cabling](#) on page 3.
- 3 Connect the power connector.
- 4 Apply power.
- 5 Access FibreBridge Services using the QuickNAV utility. Refer to [Configuring the FibreBridge](#) on page 64.
- 6 Go to the ExpressNAV **Restart** page and restart the FibreBridge.
- 7 Map your devices. Refer to [Mapping](#) on page 67.
- 8 Boot the computers on the SAN and check the configuration. Refer to [Additional configurations](#) on page 17.



### Note

The power requirements of the ATTO FibreBridge plus the power draw of the other equipment in the rack must not overload the supply circuit and/or wiring of the rack.

## 1.9 ATTO FibreBridge 2400C

*The ATTO FibreBridge 2400C is a 4-Gigabit Fibre Channel to SCSI bridge which can be embedded in a variety of enclosures to integrate industry-leading performance and SAN capabilities into future generation storage solutions.*

The FibreBridge 2400C includes two independent 4-Gigabit Fibre Channel ports and independent dual-stacked SCSI ports available in an industry-standard 4U cPCI form factor. The FibreBridge 2400 auto negotiates to 1- 2- and 4-Gigabit Fibre Channel.

### Board dimensions

Width: 6.1939 inches

Length: 6.299 inches

Height of tallest component: .545 inches

### Cooling and airflow

Operating Temperature: 0-40° C

Humidity: 10-90% non-condensing

### Power

The drive power connector (18 watts) allows the FibreBridge 2400C to draw power from a standard 12/5V drive.

### Fibre Channel port

The dual independent 4-Gigabit Fibre Channel ports can connect the FibreBridge to either a Fabric or Arbitrated Loop.

- Full support for full duplex FC data transfers, FC-AL, PLDA and public loop login.
- Small Formfactor Pluggable (SFP) interface
- Auto negotiates with 1-, 2- and 4-Gb/sec. devices

### SCSI ports

The two SCSI ports connect storage devices into the Fibre Channel Storage Area Network (SAN). Each port is totally independent from the other.

The ports are Ultra 320 SCSI busses with VHDCI connectors, downward compatible with all forms of single-ended SCSI and all previous SCSI protocols.

### Ethernet port

The 10/100 Base T Ethernet port is accessible from the RJ45 connector. Local diagnostics are supported through an integrated web server, ATTO ExpressNAV, the preferred management tool. Includes support for DHCP, Telnet, FTP, ICMP and SNMP.

### Serial interface

The 10-pin serial connector provides remote monitoring and management through a command line interface.

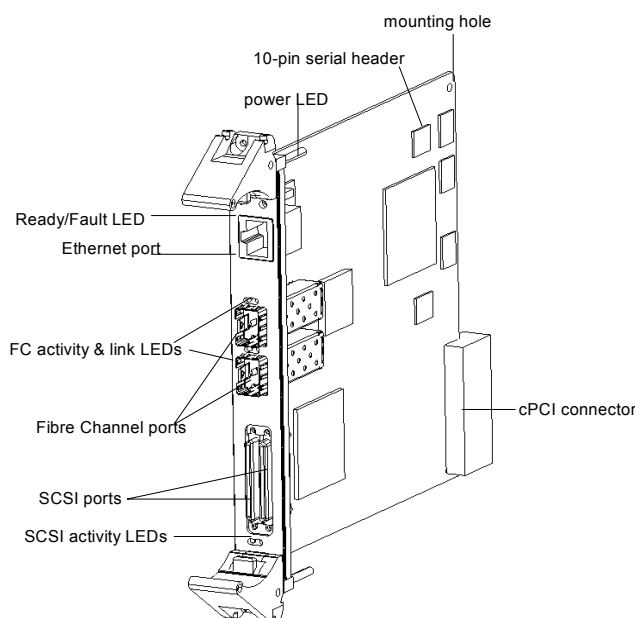
### LED indicators

**Power:** indicates if power is available from the supply.

**FC 1 and FC 2 Activity:** LEDs blink to show activity on the Fibre Channel ports (numbered 1 and 2). During very high activity, the LEDs appear to be steadily lit.

**SCSI 1 Activity, SCSI 2 Activity:** each SCSI bus has its own LED to show activity on that bus (numbered 1 and 2).

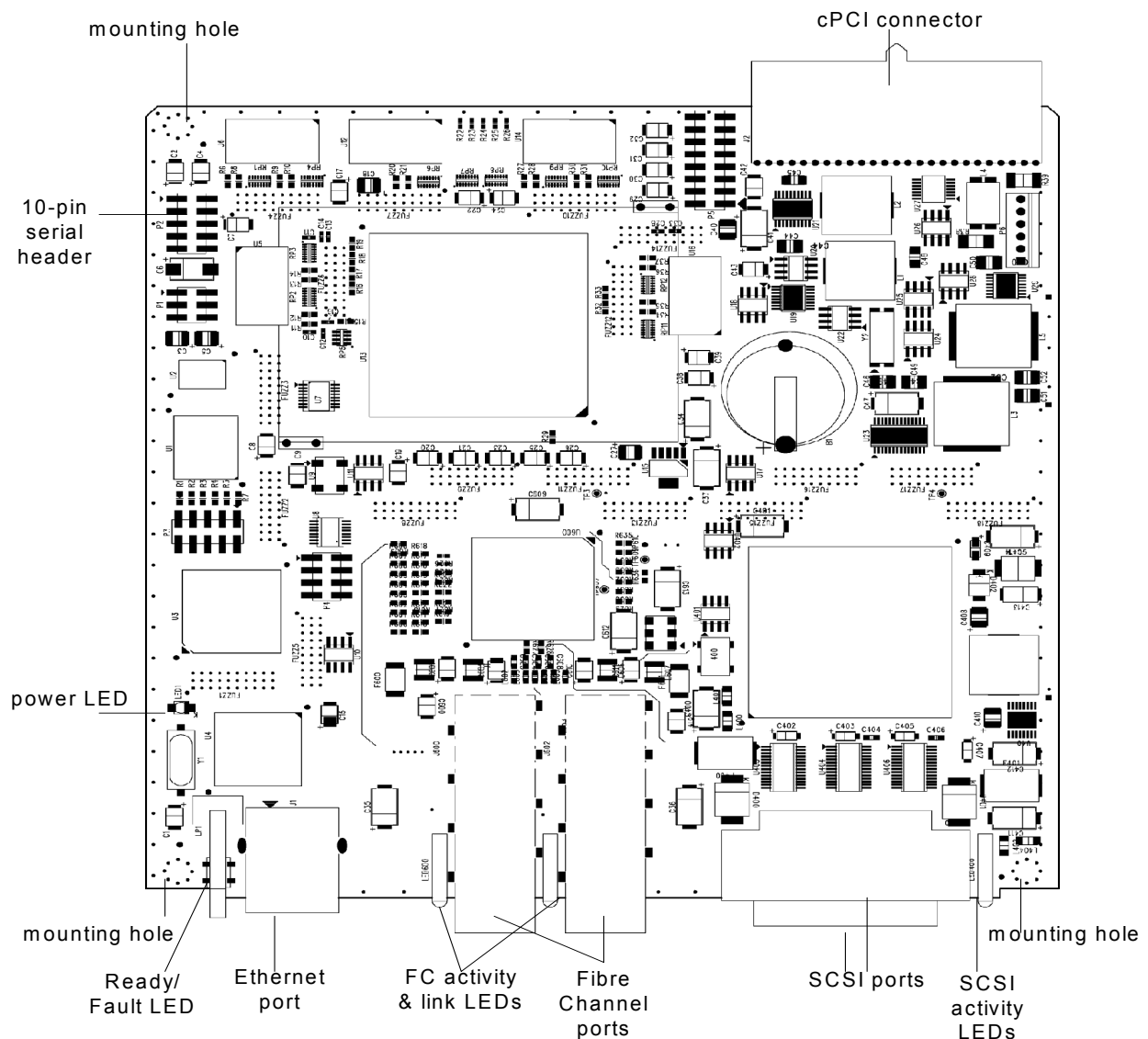
**Ready:** lights after power has been applied indicating the FibreBridge is ready to operate.



# Installation instructions

- 1 Physically place the FibreBridge in your device.
- 2 Connect a SCSI device to the FibreBridge.  
Connect the Fibre Channel port to your SAN. Connect the Ethernet cable from the Fibre Bridge to your computer. Refer to [Cabling](#) on page 3.
- 3 Connect the power connector.
- 4 Apply power.
- 5 Access FibreBridge Services using the QuickNAV utility. Refer to [Configuring the FibreBridge](#) on page 64.
- 6 Go to the ExpressNAV **Restart** page and restart the FibreBridge.
- 7 Map your devices. Refer to [Mapping](#) on page 67.
- 8 Boot the computers on the SAN and check the configuration. Refer to [Additional configurations](#) on page 17.

Exhibit 1.9-1 FibreBridge 2400C board layout



## 1.10 ATTO FibreBridge 3300R

*The ATTO FibreBridge 3300R is a 2-Gigabit Fibre Channel to SCSI bridge for midrange high performance, cost effective solutions in enterprise environments.*

The 2-Gigabit FibreBridge 3300R includes one Fibre Channel port and two SCSI ports. It may be installed horizontally into a standard 19-inch enclosure or into the ATTO FC Rack System with dual power supplies for optimum performance.

ATTO Technology FibreBridge software executes from the Intel 80303, an integrated I960JT processor and PCI-PCI bridge with 128 MB SDRAM, capable of 800 MB/sec.

### Dimensions

- Width: 17.4 inches (441.6 mm)
- Depth: 17 inches (431.5 mm)
- Height: 1.72 inches (43.15 mm) (1U)
- Weight: approx. 10 pounds

### Cooling and airflow

- Operating Temperature: 5-40° C
- Humidity: 10-90% non-condensing

Air enters from the sides at the module end and is exhausted out the power supply module side by a pair of 10 cfm fans. Ambient air near the inlets should not exceed 70°C. The unit will stop automatically if the temperature goes beyond this threshold.



### WARNING

**Do not block the enclosure's vents. The FibreBridge will shut down if overheating occurs.**

### Power

The ATTO FC Rack System has two redundant hot swappable power supplies. Each power supply module has one standard IEC320 power receptacle and switch.

The universal power supply provides power for the bridge board and cooling fans.

- Input voltage: 110V~/2A/60 HZ, 230V~/1A 50 HZ. The AC input range selection is automatic with no manual or jumper switchover required.
- Output voltage: +12V at 5 amps

### Fibre Channel port

The single 2-Gigabit Fibre Channel port can connect the FibreBridge to either a Fabric or Arbitrated Loop.

- Qlogic ISP2300 Fibre Channel controller
- 2.125 Gigabit/sec.
- Class 2, Class 3 and ANSI Fibre Channel specifications support
- PLDA, Public Loop Login (NL\_port) and Fabric Direct Connect (N\_port) support
- Full Duplex transmission support
- Small Formfactor Pluggable (SFP) with copper or fiber interface

### SCSI ports

The two Ultra 3 LVD/SE SCSI busses connect storage devices into the Fibre Channel Storage Area Network (SAN). Each port is totally independent from the other.

- 68-pin "P" interface
- 160 MB/sec. max throughput, downward compatible with all forms of single-ended SCSI.
- LSI 53C1010 SCSI controller

### Ethernet port

The 10/100 Base T Ethernet port implemented with an Intel 82559ER accessible from the RJ45 connector supports SNMP- and Telnet-based monitoring and management through a command line interface, menu system or graphical interface (ATTO BridgeTools).

### Serial port

The RS-232 serial port provides support for remote monitoring and management through a command line interface, menu system or

graphical interface (ATTO Technology BridgeTools).

## LED indicators

The LED indicators can be viewed from both the front and the back of the FibreBridge 3300R.

**Power** indicates if power is available.

**FC Activity:** LED blinks to show activity on the Fibre Channel port (numbered 0). During very high activity, the LEDs appear to be steadily lit.

**2 Gigabit operation:** a lit LED indicates the FibreBridge is using 2 Gigabit.

**SCSI 0 Activity, SCSI 1 Activity:** each SCSI bus has its own LED to show activity on that bus.

**Ready:** should light after power has been applied indicating the FibreBridge is ready to operate.

## Installation instructions


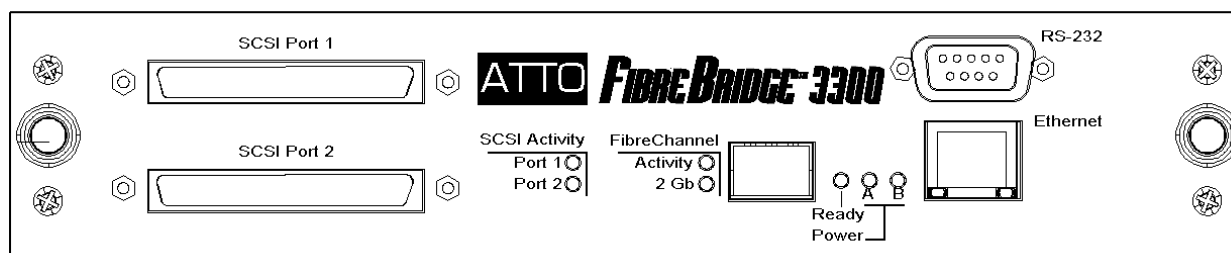
- 1 Physically place the FibreBridge on a desktop or into a rack.
  - a. To mount on a rack, install “L” brackets so that either the front or the connector side of the FibreBridge faces front. The mounting holes on the bracket fit a standard 19-inch rack using a centered 1.25-inch (31.7 mm) hole pattern.
  - b. Install the FibreBridge horizontally within the rack so it does not reduce the air flow.
-  **Note**  
*The power requirements of the ATTO FibreBridge plus the power draw of the other equipment in the rack must not overload the supply circuit and/or wiring of the rack.*
- c. Properly ground the FibreBridge to the rack equipment. The earth ground connection must be maintained.
- 2 Connect a SCSI device to the FibreBridge. Connect the Fibre Channel port to your SAN. Connect the Ethernet cable from the Fibre Bridge to your computer. Refer to [Cabling](#) on page 3.
- 3 Connect the power connector.
- 4 Apply power.
- 5 Access FibreBridge Services using the QuickNAV utility. Refer to [Configuring the FibreBridge](#) on page 64.
- 6 Go to the ExpressNAV **Restart** page and restart the FibreBridge.
- 7 Map your devices. Refer to [Mapping](#) on page 67.
- 8 Boot the computers on the SAN and check the configuration. Refer to [Additional configurations](#) on page 17.

Exhibit 1.10-1 Connector side of the ATTO FibreBridge 3300R.





## 2.0 Interfaces

*FibreBridge Services interfaces include ATTO ExpressNAV, a menu system, Command Line Interface (CLI) or ATTO BridgeTools. ATTO ExpressNAV is not available for the ATTO FibreBridge 1180 which uses the graphical interface ATTO BridgeTools.*

ATTO FibreBridge Services includes displaying and modifying various attributes of FibreBridge operation, as well as the update of firmware.

The best interface is ATTO ExpressNAV, a browser-based graphical interface for all FibreBridge models except the FibreBridge 1180. Use ATTO BridgeTools for the FibreBridge 1180.

You might use the command line interface (CLI) or menu system, depending on your operating system, what you want to accomplish, the method you are using to access FibreBridge Services, and your FibreBridge model. The menu system is not available for the ATTO FibreBridge 2400.

Access FibreBridge Services through the Ethernet port, the RS-232 serial port or the Fibre Channel port (see [Configuring the FibreBridge](#) on page 64).

### ATTO ExpressNAV interface

ATTO ExpressNAV is a monitoring and configuration tool accessible through the Ethernet port and a web browser. Platform independent, ExpressNAV contains all the current capabilities of the CLI in a user-friendly GUI interface.

A diagram showing each port in the product faceplate is clickable and takes you to the appropriate page. A menu also provides access to various pages for information and configuration operations. Refer to [ATTO ExpressNAV interface](#) on page 31 for more information on the program. Refer to [CLI summary reference](#) on page 41 for a summary of commands for each FibreBridge model and their defaults. Explanations of the commands are in the chapters following [Command Line Interface use and guidance](#) on page 39.

### ATTO BridgeTools (FibreBridge 1180 only)

The simplest way to communicate with the ATTO FibreBridge 1180 is to use BridgeTools, a Java-based graphical interface configuration utility designed to flash firmware and manage the configuration.

The ATTO BridgeTools program supports Sun Solaris 8, Mac OS X and Windows 95/98/ME, NT and 2000.

At the startup, a screen will present choices to communicate with the FibreBridge: using the serial port or an in-band connection over the Fibre Channel link.

A tabbed panel interface presents configuration parameters in a one-window display. Message boxes, icons, drop-down boxes, menu bars and other common graphical constructs lead you through the configuration process.

Refer to the ATTO BridgeTools Installation and Operation Manual for complete instructions to install and operate the program.

### Command Line Interface (CLI)

The Command Line Interface provides access to FibreBridge Services through ASCII command lines. It is reached through the serial port or the Fibre Channel link or through the Advanced page of the

The initial display, after powering up the unit or restarting the firmware, will contain the information in Exhibit 1.1-3 on page 8. Once the initial display is complete, with the word **Ready**, you are in the Command Line Interface mode.

Type **Help** to display a list of all commands available for your ATTO FibreBridge model and refer to [CLI summary reference](#) on page 41.



## Menu mode

The Menu contains most commands available through CLI but in a hierarchal format. It follows a standard menu/choice model. The menu mode is not available for the FibreBridge 2400.

The initial display, after powering up the unit or restarting the firmware, will show start up

messages. Once the initial display is complete, with the word **Ready**, you are in the Command Line Interface mode. Type **Menu** and you will enter the menu system.

## 2.1 ATTO ExpressNAV interface

*ExpressNAV is a web-based graphical user interface (GUI) that allows you to manage the FibreBridge by clicking choices and commands in traditional GUI fashion or by entering CLI commands directly as you would in a terminal emulation session. ATTO ExpressNAV is not available for the FibreBridge 1180.*

Access ATTO ExpressNAV from any web browser that supports the latest standards for XHTML 1.0 and CSS1. To take full advantage of the ExpressNAV interface you should have Java script enabled through your browser.

To use the interface you must first have an IP address for the FibreBridge. Refer to [Using the Ethernet port](#) on page 5.



### Note

*The recommended management tool for the all models of the FibreBridge except the FB 1180 is the ATTO ExpressNAV interface.*

### Browser compatibility

All pages are written in pure XHTML 1.0 and CSS1 to be compatible with the latest versions of Internet Explorer, Netscape, Mozilla (including K-Meleon, Camino, Mozilla Firefox, Epiphany and Galeon), and KHTML (including Konqueror and Safari).

Minimum requirement is for Internet Explorer 5.5 and Netscape 6.2.

### Open an ExpressNAV session

- 1 Obtain the IP address of the FibreBridge. Refer to [Using the Ethernet port](#) on page 5.
- 2 Type the IP address of the FibreBridge into the browser address window.
- 3 The ExpressNAV interface splash screen is displayed. Click on **Enter**.
- 4 Enter the username and password.
  - The default username is **root**
  - The default password is **Password**
- 5 The product faceplate display appears. Click the component you want to manage on the left-hand side menu or go to the Advanced screen to use the CLI (command line interface).

An image on each page's header shows each port in the product faceplate. Each port is clickable and will take you to the appropriate page.

All pages, whether connected to ports or not, are accessible by clicking on their titles on the left side of the page. You may also go back one page or go to the **Home Page** via the titles on the left side of the page.

Clicking on any of the red option names will bring up a help window. After making changes on a page, click the **Submit** button at the bottom. Clicking this button is equivalent to typing in all the CLI commands and then the command **saveconfiguration norestart**.

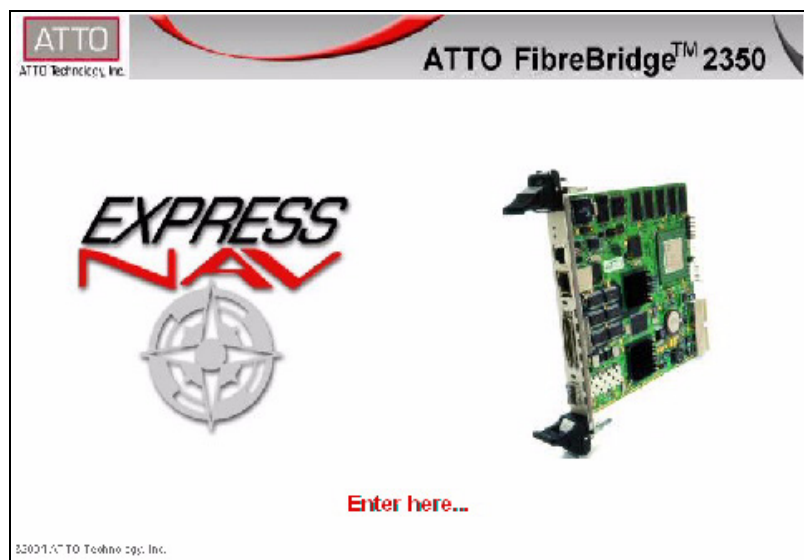
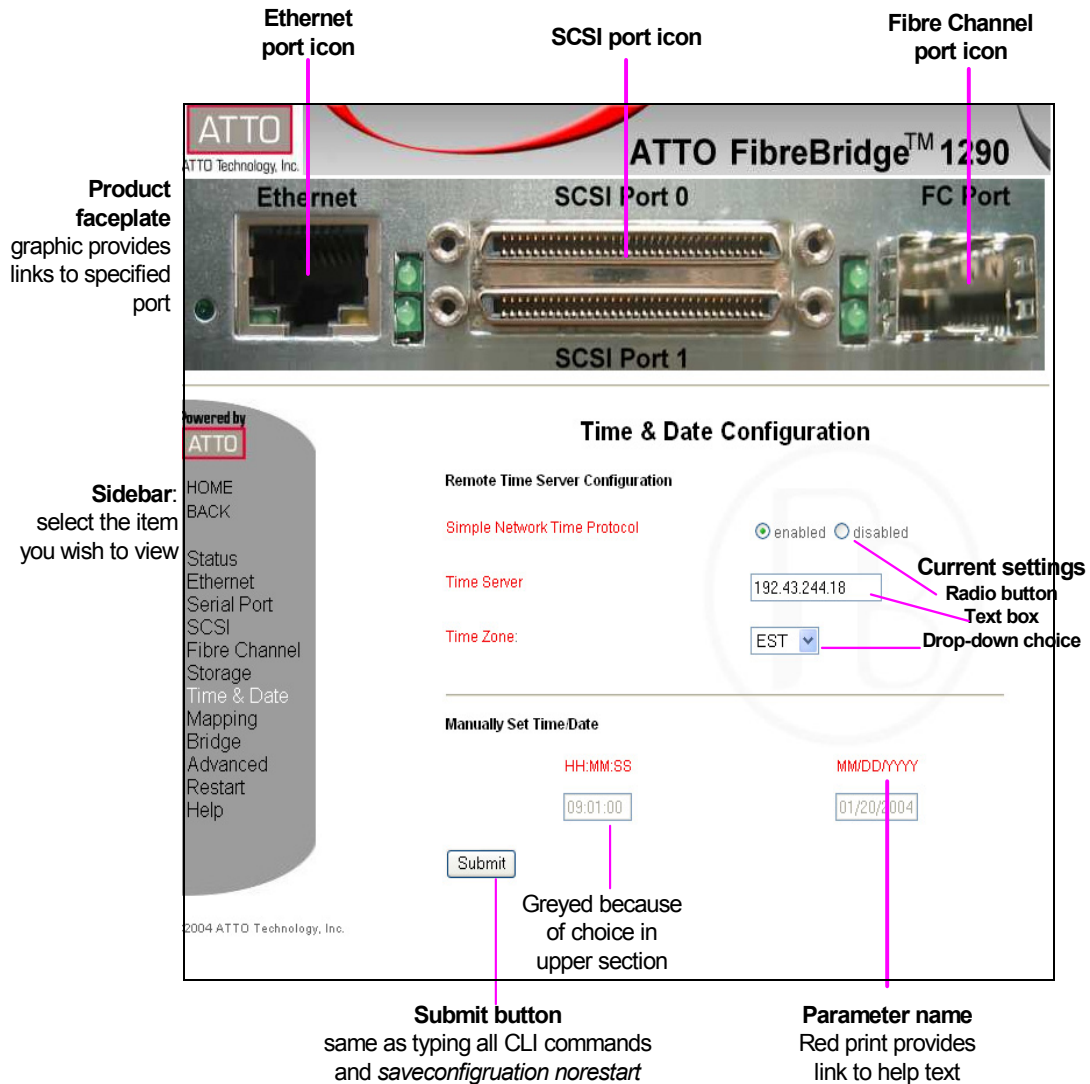


Exhibit 2.1-1 A typical ExpressNAV page.



## 2.1.2 ExpressNAV pages

*Each page in the ATTO ExpressNAV interface provides information and/or configuration parameters based on a specific topics. The exact settings available depend on the model of FibreBridge you are using. ExpressNAV is not available for the FibreBridge 1180.*

Screens in the ATTO ExpressNAV interface can be reached through the menu at the side of each page or through the image on each page's header which shows each port in the product faceplate. Some screens and parameters are not available for all FibreBridge models. Use the following as a guide only.

### Status

Displays FibreBridge information

- Vendor ID
- Product ID
- Firmware revision number
- Serial number
- Valid temperature range
- Current temperature
- Node name
- Port name
- Fibre Channel port status
- SCSI port status

### Ethernet port configuration

Configures each port independently for the following parameters

- IP address
- IP gateway
- IP subnet mask
- Ethernet speed
- DHCP fixed delay

See [Ethernet configuration commands](#) on page 59 for details.

### Serial port configuration

Configurable options are baud rate, echo and stop bits. See [Serial port configuration commands](#) on page 58 for details.

### SCSI configuration

Each SCSI port is configured separately. Displays include a list of attached devices for each bus.

Configurable options are

- Port bus speed
- Synchronous transfer
- Wide transfer

- Initiator ID
- Selection timeout
- Tagged command queuing
- Bus reset on startup
- Bus termination
- Attached devices listed by bus number

Click on the individual bus for information on each SCSI device.

See [SCSI configuration commands](#) on page 53 for details.

### Fibre Channel configuration

Configurable options on the port independent options page

- Data rate
- Full duplex
- Connection mode
- Arbitration fairness
- Hard address assignment
- Fibre Channel class 2
- Ack 0
- FCP-2 compliance
- FCP-2 confirmation IU requests
- Accept CRNs
- Busy status return

The node name, port name and a list of attached devices are displayed on the port specific options page. the following options are configurable

- Node name
- Port name
- Target LUN
- Services LUN
- Hard address
- List attached devices

See [Fibre Channel configuration commands](#) on page 55 for details on each parameter.

### Storage management

A list of attached SCSI devices and a list of attached Fibre Channel devices are displayed. Click on the individual bus or port for detailed information on each device.

You may also reset SCSI ports on this page. The following options are configurable

- Boot scan
- Boot scan ports
- Boot Fibre delay
- SpeedWrite default
- Virtual drive response
- FC initiator mode

See [Fibre Channel configuration commands](#) on page 55 and [SCSI configuration commands](#) on page 53 for details on each parameter.

### Time & date configuration

Configures the real-time clock or access remote time server. Configurable options are

- Enable/disable Simple Network Time Protocol
- Time server
- Time zone
- manually set time
- manually set date

See [Maintenance commands](#) on page 51 for details.

### Mapping

You may map drives using the ExpressNAV Mapping page. See [Mapping](#) on page 67 and [Mapping commands](#) on page 61 for details.

### Bridge management

Configurable options are

- User name
- Old Password
- New Password
- Confirm Password
- Minimum Operating Temperature
- Maximum Operating Temperature
- Operating Temperature Warning
- Identify Bridge
- Restore Defaults

See [Maintenance commands](#) on page 51 for details.

### Advanced CLI configuration

Allows you to input any CLI command available through the FibreBridge.

#### To use the Advanced Configuration page

- 1 Type in the CLI command
- 2 Click the **Submit** button: this is equivalent to typing in the CLI command into a TCP/IP or serial port CLI session.

A text field beneath the box will list the most recent commands issued to the FibreBridge through this page.

If you enter an incorrect parameter, the CLI help text will be displayed, showing the parameters available.

- 3 If your entry was correct, type **saveconfiguration**
- 4 Click the **Submit** button. Your changes will be implemented.

### Update firmware (FB 2400 only)

Updates firmware. Follow the instructions on the page.



#### CAUTION

**Before beginning this procedure, ensure that all I/O to the FibreBridge has stopped.**

Refer to [Updating firmware on page 79](#) for details.

### Restart firmware

Implements a firmware restart of the bridge and makes permanent any changes you have made since the last firmware restart.



#### CAUTION

**Restarting the firmware may take a few minutes.**

- 1 Click the **Restart** button.  
A box will tell you to wait until the counter gets to 0 and then the browser will refresh.
- 2 If the browser does not refresh after the counter gets to 0, click the link to refresh it manually.

### Help

Gives help information about the command line interface commands and troubleshooting tips via links to pages with help text for each category of options and one link to the Troubleshooting Tips and FAQs page on the ATTO website, [www.attotech.com](http://www.attotech.com).

Contact information for ATTO technical support is on the right. Help is always available by pressing any word shown in red on the screen.

## 2.2 ATTO BridgeTools for FB1180 only

---

*The simplest way to communicate with the ATTO FibreBridge 1180 is to use ATTO BridgeTools, a Java-based graphical interface configuration utility designed to flash firmware and manage the configuration for the FibreBridge.*

Configuration of the ATTO FibreBridge 1180 includes displaying and modifying various attributes of FibreBridge operation, as well as the update of firmware. BridgeTools presents you with the applicable configuration options.

The ATTO BridgeTools program supports Sun Solaris 8, MAC OS 10.1 and Windows 95/98/ME, NT and 2000.

Communicate with the FibreBridge 1180 either through in-band SCSI over Fibre Channel or the RS-232 port.

A tabbed panel interface presents configuration parameters in a simple, one-window display. Message boxes, icons, drop-down boxes, menu bars and other common graphical constructs will lead you through the configuration process.

The ATTO BridgeTools Installation and Operation Manual has complete instructions on how to install and operate the program.

## 2.3 Menu: text-based interface

*Configuration is available via a menu which contains most commands available through CLI but in a hierarchical user-friendly format. It follows a standard menu/choice model. This method is not available for the FibreBridge 2400.*

Configuration of the FibreBridge includes displaying and modifying various attributes of FibreBridge operation, as well as the update of firmware. The menu system provides access to ATTO FibreBridge services in a standard menu/choice model, and displays options and current status for all ATTO FibreBridge models except the FibreBridge 2400.

- 1 Communicate with the FibreBridge through the RS-232 port. Refer to [Using the serial port](#) on page 7.
- 2 The Command Line Interface mode is available after the initial display is complete, ending with the word **Ready**. Type **Menu** to enter the menu system.

### Conventions

Ellipses (...) show that a choice will lead to another menu. For example, if you choose **a)** on the FibreBridge **Main Menu**, you will see another menu, **FibreBridge Configuration Menu**. If you choose **b) Fibre Channel Configuration**, you will see a different menu, **Fibre Channel Configuration Menu**.

Brackets after a menu item show current settings. If you choose **a)** on the FibreBridge Configuration Menu, one level beyond the **Main Menu**, you will see

```
FibreBridge Name [          ]
```

No ellipses follow: this is the last choice. If you wish to change the [ ], you type in your response to

```
Enter FibreBridge Name (Max of 8
characters)
```

In the **Fibre Channel Configuration Menu**, choosing **Port Connection Mode (loop)** presents you with the following:

```
This option determines the port type to
which the FibreBridge will attempt to
```

```
login. Loop Mode allows Arbitrated Loop
(FC_AL) logins via an FL_Port.
Point-to-Point Mode (ptp) allows
connection to a fabric port (F_Port).
Type the letter of your choice and press
'Enter'.
```

```
Connection Mode: a) Loop, b) Point-to-
Point:"
```

Typing **a** will enable loop mode, typing **b** will enable point-to-point mode.

### Examples

FibreBridge Main Menu

```
-----
a) FibreBridge Configuration...
b) FibreBridge Maintenance...
c) FibreBridge Diagnostics...
d) Save / Restore Configuration....
x) Ext Menu Mode
Enter a-d or x:
```

```
*** Choice a) ***
```

FibreBridge Configuration Menu

```
-----
a) FibreBridge Name [          ]
b) Fibre Channel Configuration...
c) SCSI Port Configuration...
d) Routing Configuration...
e) Serial (RS-232) Port Configuration...
f) Network Configuration...
x) Return to previous menu...
Enter a-f or x:
```

```
*** Choice b) ***
```

Fibre Channel Configuration Menu

```
-----
a) Port Connection Mode [loop]
b) FC-AL Arbitration Fairness [enabled]
c) Full Duplex Mode [enabled]
d) List Fibre Channel Ports
e) Unprocessed SCSI Command Returns [busy]
f) FC-AL Hard Addressing Mode [disabled]
g) Fibre Channel Class 2 service [disabled]
h) Fibre Channel ACK0 acknowledgements
[disabled]
i) Fibre Channel Initiator Mode [enabled]
j) Fibre Channel Port 0 Configuration...
x) Return to previous menu...
Enter a-j or x:
```



## 2.4 In-band CLI: SCSI over Fibre Channel

*In-band Command Line Interface (CLI) configures and manages the ATTO FibreBridge using SCSI-based CLI commands over a Fibre Channel port connection. This feature is not available for the FibreBridge 2400.*



### Note

*The recommended management tool for the all models of the FibreBridge except the FB 1180 is the ATTO ExpressNAV interface. Refer to [ATTO ExpressNAV interface](#) on page 31. The recommended management tool for the FibreBridge 1180 is ATTO BridgeTools. Refer to [ATTO BridgeTools for FB1180 only](#) on page 35*

In-band CLI allows you to configure the FibreBridge while it is moving data. Using a programmer's interface, ATTO FibreBridge Services CLI commands, as described previously in this manual, may be implemented. The only command not available is **menu**.

In-band CLI is implemented as a device separate from the FibreBridge itself. It uses a different LUN than the FibreBridge, and reports as a Storage Enclosure Services (SES) device (device type 0x0D). This LUN is referred to as the ServicesLUN.

The ServicesLUN is visible on all Fibre ports but is actually a single unit. The default Fibre LUN for each Fibre port's ServicesLUN is 0x08.

The ServicesLUN must be reserved for each Write Buffer/Read Buffer pair, using the SCSI **Reserve** command to insure integrity of the in-band CLI session.

- 1 An initiator (host) sends a SCSI **Reserve** command to the ServicesLUN.
  - If the ServicesLUN is not reserved by another initiator, the ServicesLUN is now reserved and ready to begin a new CLI session.
  - If the FibreBridge configuration is reserved by a different CLI session (i.e. serial or Telnet), the in-band session will not be allowed to modify the FibreBridge configuration. If you try, the results buffer of the ServicesLUN will return

Process X has the configuration reserved.

ID of this session = Y

Ready.

- 2 The initiator issues a SCSI **WriteBuffer** (buffer ID = 0) command to the ServicesLUN. A **WriteBuffer** command must be accompanied by an ASCII buffer representing the CLI command string such as

```
set FibreBridgeName FB2300
```

- 3 The ServicesLUN will execute the command line and create feedback in the form of ASCII characters into a buffer. This buffer is 8KB and circular. Retrieve the results by issuing a **ReadBuffer** command before issuing another **WriteBuffer** command.
- 4 A subsequent **WriteBuffer** command will execute the new command line and overwrite the previous results in the buffer with new results.
- 5 The ServicesLUN can be released by issuing a SCSI **Release** command to the Services LUN after each Write/Read Buffer pair, or multiple Write/Read Buffer pairs.

Initiator (Host)	FibreBridge
Reserve ServicesLUN	return: "ok"
Write Buffer ServicesLUN bid 0 "get SerialPortBaudRate"	executes the CLI command, stores output in buffer
Read Buffer ServicesLUN bid 0	return: "SerialPortBaudRate=960 0\W\  Ready.\r\n\n0"
Release ServicesLUN	return: "ok"



## I/O details

The buffer sent to the Services LUN during the data out phase of a **Write Buffer** command must be

- ASCII data
- maximum 80 bytes length
- terminated with either a carriage return character (0x0D), line feed character (0x0A) or NULL character (0x00)
- Characters following the first carriage return character, line feed character or NULL character are ignored.

The buffer retrieved from the Services LUN during the data-in phase of a Read Buffer command will be

- ASCII data
- maximum 8 KBytes (8192 bytes) in length
- terminated with a **NULL** character (0x00)
- Characters following the **NULL** character are meaningless.

A **CHECK\_CONDITION, INVALID\_PARAMETER\_IN\_CDB** will be returned to an initiator that specifies an incorrect Buffer ID, Mode, Length or Buffer Offset. The Mode is always Data (0x2), the Buffer ID is always 0 and the Buffer Offset is always 0.

*Exhibit 2.4-1 The SCSI command process: reserve the FibreBridge, send command, release the bridge.*

Initiator/Host	FibreBridge
<b>Goal:</b> reserve the FibreBridge for an in-band CLI command	
SCSI cdb: Reserve ServicesLUN	=>
	<= SCSI success
<b>Goal:</b> retrieve the FibreBridge temperature via in-band CLI	
1. Issue the command:	
SCSI cdb: WriteBuffer ServicesLUN, bid=0, "get SerialPortBaudRate\n"	=> places "SerialPortBaudRate=9600\n\r" into the read-data buffer
	<= SCSI success
2. Retrieve the results:	
SCSI cdb: ReadBuffer ServicesLUN, bid=0	=>
	<= Returns "SerialPortBaudRate=9600\n\r" from the read-data buffer
	<= SCSI success
<b>Goal:</b> release the FibreBridge for other in-band users	
SCSI cdb: Release ServicesLUN	=>
	<= SCSI success

## 2.5 Command Line Interface use and guidance

*The command line interface (CLI) provides access to the ATTO FibreBridge Services through a set of ASCII commands. CLI commands may be entered while in CLI mode.*

FibreBridge Services provide configuration and monitoring for the FibreBridge. The command line interface (CLI) is a set of ASCII-based commands which perform these tasks. CLI commands may be entered while in CLI mode.

- CLI commands are context sensitive and generally follow a standard format

[Get|Set] Command [Parameter1|Parameter2]

followed by the **return** or **enter** key

- CLI commands are case insensitive: you may type all upper or all lower case or a mixture. Upper and lower case in this manual and the **help** screen are for clarification only.
- Commands generally have three types of operation: get, set and immediate.
- The get form returns the value of a parameter or setting and is an informational command.
- Responses to get commands are followed by **Ready**.
- The set form is an action that changes the value of a parameter or configuration setting. It may require a **SaveConfiguration** command and a restart of the system before it is implemented. The restart can be accomplished as part of the **SaveConfiguration** command or by using a separate **FirmwareRestart** command. A number of set commands may be issued before the **SaveConfiguration** command.
- Responses to **set** commands are either an error message or **Ready**. \*. The asterisk indicates you must use a **SaveConfiguration** command to finalize the **set** command. **SaveConfiguration** will ask if you want to restart the system or not.
- Set commands which do not require a **SaveConfiguration** command, defined as immediate commands, are immediately executed.
- Responses to Immediate commands are either an error message or data results followed by **Ready**.

*Exhibit 2.5-1 Symbols, typefaces and abbreviations used to indicate functions and elements of the command line interface used in this manual.*

### Command conventions

Symbol	Indicates
[ ]	Required entry
< >	Optional entry
	pick one of
...	Ellipses, repetition of preceding item
\n	end of line
-	a range (6 – 9 = 6, 7, 8, 9)
Boldface words	must be typed as they appear
Italicized words	Arguments which must be replaced by whatever they represent
fl	Fibre Channel lun number (0 <= fl <= 31)
fp	Fibre Channel port number (0 ✚ fp <= 2)
sb	SCSI bus number (0<= sb <= 3)
sl	SCSI lun ID (0 <= sl <= 7)
st	SCSI target ID (0 <= st <= 15)

## CLI error messages

---

*The following error messages may be returned by the Command line Interface*

ERROR. Invalid Command. Type 'Help' for command list.

ERROR. Wrong/Missing Parameters

Usage: <usage string>

ERROR. Command Not Processed

*Exhibit 2.5-1 If you enter a parameter for a CLI command incorrectly, the CLI help file will display with the error message:*

```
Ready. *
set optempwarn 55

ERROR Wrong/Missing Parameters
Usage:
[set | get] OptTempwarn [0 - 15]

Ready. *
set optempwarn 10

Ready. *
```

Incorrect entry →

Error message →

including correct parameters as listed in **Help** →

Correct entry →

Response →

## 2.5.1 CLI summary reference

*A summary of the Command Line Interface commands, their defaults, and where you can find the specifics of the command. Commands which have no default values associated with them have a blank entry in that column of the table. Commands which do not apply to a particular FibreBridge model are marked N/A.*

Command	FB1180	FB1290	FB2300 / FB3300	FB2350	FB2400	pg
AddressMap	A	A	A	A	N/A	61
AutoLogSense	N/A	disabled	disabled	disabled	disabled	46
AutoMap						61
BootFibreDelay	0	0	N/A	0	0	55
BootScan	N/A	disabled	N/A	disabled	disabled	55
BootScanPorts	N/A	auto	N/A	auto	auto	55
BridgeModel	N/A	N/A	N/A	N/A		46
BridgeName	N/A	N/A	N/A	N/A	“ “	46
ClearEventLog						46
ClearTraceLog						46
Date	01/01/2000	01/01/2000	01/01/2000	01/01/2000	01/01/2000	51
DHCPFixedDelay	N/A	0	N/A	N/A	0	59
DispFCPortDB					N/A	46
DisplayEventLog						46
DisplayEventLogFilter	all disabled	all disabled	all disabled	all disabled	all disabled	46
DisplayTraceLog						46
DisplayTraceLogFilter	all disabled	all disabled	all disabled	all disabled	all disabled	47
DumpEventLog						47
DumpTraceLog						47
EccLog					N/A	47
ErrorLog					N/A	47
EthernetSpeed	N/A	auto	auto	auto	auto	59
EventLog	enabled	enabled	enabled	enabled	enabled	47
EventLogFilter	all disabled	all disabled	all disabled	all disabled	all disabled	47
Exit	N/A					59
FCAck0	disabled	disabled	disabled	disabled	N/A	55
FCClass2	disabled	disabled	disabled	disabled	N/A	55
FCConnMode	loop	loop	loop	loop	loop	55
FCDataRate	N/A	auto	auto	auto	auto	55
FCFairArb	enabled	enabled	enabled	enabled	N/A	56
FCFullDuplex	enabled	enabled	enabled	enabled	N/A	56
FCHard	disabled	disabled	disabled	disabled	disabled	56

Command	FB1180	FB1290	FB2300 / FB3300	FB2350	FB2400	pg
FCHardAddress	0x03	0x03	0x03	0x03	0x03	56
FCInitiator	disabled	disabled	disabled	disabled	N/A	56
FCP2	N/A	disabled	N/A	N/A	N/A	56
FCP2Conf	N/A	disabled	N/A	N/A	N/A	56
FCP2CRN	N/A	disabled	N/A	N/A	N/A	56
FCPortFailover	N/A	N/A	N/A	N/A	disabled	57
FCPortList						47
FCPortRecover	N/A	N/A	N/A	N/A		57
FCSCSIBusyStatus	busy	busy	busy	busy	qfull	57
FCTargets					N/A	47
FCWWName						47
FibreBridgeModel					N/A	48
FibreBridgeName	“ ”	“ ”	“ ”	“ ”	N/A	48
FibreBridgeTargetLUN	0x07	0x07	0x07	0x07	N/A	61
FirmwareRestart						51
FixedLengthReqSense	disabled	disabled	disabled	disabled	N/A	48
Help						45
IdentifyBridge	N/A	N/A	N/A	N/A	disabled	48
IdentifyFibreBridge	disabled	disabled	disabled	disabled	N/A	48
Info						48
IPAddress	N/A	10.0.0.1	10.0.0.1	10.0.0.1	10.0.0.1	59
IPDHCP	N/A	disabled	disabled	disabled	enabled	59
IPGateway	N/A	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0	59
IPSubnetMask	N/A	255.255.0.0	255.255.0.0	255.255.0.0	255.255.0.0	59
IsReserved						51
LogicalUnitAddressing	N/A	N/A	N/A	N/A	disabled	62
MaxOpTemp	N/A	70	70	70	70	51
Menu					N/A	45
MinOpTemp	N/A	0	0	0	0	51
OpTempWarn	N/A	5	5	5	5	51
ParityLog					N/A	48
Password	N/A	Password	Password	Password	Password	60
Ping						60
Performance						48
ReadOnlyPassword	N/A	N/A	N/A	N/A	Password	60
ReadOnlyUsername	N/A	N/A	N/A	N/A	User	60
Reserve						51
RestoreConfiguration						45

Command	FB1180	FB1290	FB2300 / FB3300	FB2350	FB2400	pg
Route	N/A	N/A	N/A	N/A		62
RouteChange	See Appendix A				N/A	62
RouteDisplay						62
RouteOffLine	See Appendix A				N/A	62
RouteOnLine	See Appendix A				N/A	63
SaveConfiguration						45
SCSIInitId	0x07	0x07	0x07	0x07	0x07	53
SCSIPortBusSpeed	ultra2	ultra3	ultra3	ultra3	ultra4	53
SCSIPortList						48
SCSIPortReset						52
SCSIPortResetOnStartup	enabled	enabled	enabled	enabled	enabled	53
SCSIPortSelTimeout	256ms	256ms	256ms	256ms	N/A	54
SCSIPortSyncTransfer	enabled	enabled	enabled	enabled	enabled	54
SCSIPortTaggedQueuing	disabled	disabled	disabled	disabled	N/A	54
SCSIPortTermination	N/A	N/A	N/A	N/A	disabled	54
SCSIPortWideTransfer	enabled	enabled	enabled	enabled	enabled	54
SCSITargets						48
SCSITermination	enabled	enabled	enabled	enabled	N/A	54
SerialNumber						48
SerialPortBaudRate	9600	9600	9600	9600	11500	58
SerialPortEcho	disabled	disabled	disabled	disabled	enabled	58
SerialPortStopBits	1	1	1	1	N/A	58
ServicesLUN	0x08	0x08	0x08	0x08	N/A	57
SNMPDumpMIB	N/A					48
SNMPExtendedTraps	N/A	disabled	disabled	disabled	N/A	48
SNMPTrapAddress	N/A	all none	all none	all none	all none	48
SNMPTraps	N/A	disabled	disabled	disabled	disabled	49
SNTP	N/A	enabled	enabled	enabled	enabled	52
SNTPServer	N/A	See help text				52
SpeedWrite	all disabled	all disabled	all disabled	all disabled	all disabled	52
SpeedWriteDefault	disabled	disabled	disabled	disabled	disabled	52
Temperature	N/A					49
Time	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	52
TimeZone	N/A	EST	EST	EST	EST	52
TraceLog	disabled	disabled	disabled	disabled	disabled	49
TraceLogFilter	disabled	disabled	disabled	disabled	disabled	49
Username	N/A	root	root	root	root	60
VerboseMode	enabled	enabled	enabled	enabled	enabled	45

Command	FB1180	FB1290	FB2300 / FB3300	FB2350	FB2400	pg
VirtualDriveResponse	N/A	disabled	N/A	disabled	disabled	54
Voltage	N/A	N/A	N/A			49
WrapEventLog	enabled	enabled	enabled	enabled	enabled	49
WrapTraceLog	enabled	enabled	enabled	enabled	enabled	49
XCDevices					N/A	49
XCError					N/A	50
XCStatus					N/A	50
Zmodem						52

## 2.5.2 General use commands

*These CLI commands are used in a variety of situations. Any commands which require Ethernet are not available for ATTO FibreBridge 1180 models. Refer to the [CLI summary reference](#) on page 41 to determine which CLI commands apply to your model.*

### Help

*Displays a list of available commands. If command name is specified, displays detailed command-specific information.*

Immediate: Help [command name]

### Menu

*Turns the menu interface on or off. If the interface is on, other parameters such as ECHO will also be enabled.*

Immediate: menu

### RestoreConfiguration

*Restores configuration to either the default configuration or the configuration last saved into non-volatile memory. The saved option will undo any changes made since the last save.*

Immediate: RestoreConfiguration [Default | Saved]

### SaveConfiguration

*Many commands require a **SaveConfiguration** command to be executed. This will be indicated by the return **Ready. \***. When you invoke a*

***SaveConfiguration** command, the current configuration is permanently saved in the FibreBridge and the new configuration becomes the active configuration. If a firmware restart is required to make the requested change permanent, you are asked to confirm the restart. You can override this request by indicating the override value on the command line. You may make several changes through commands before implementing the restart, but once you have restarted the FibreBridge, all the command changes created before the restart and save will be implemented. If you select the restart option, the FibreBridge will execute its complete start up cycle.*

Immediate: SaveConfiguration <Restart | NoRestart>

### VerboseMode

*Specifies the detail of feedback for the command line interface. Disabling this option removes parameter names from action commands and removes descriptions from information commands.*

Default: enabled (returns have parameter information)

Set syntax: set VerboseMode [enabled | disabled]

Get syntax: get VerboseMode



## 2.5.3 Diagnostic commands

*ATTO FibreBridge diagnostic commands help validate FibreBridge operation and diagnose/isolate FibreBridge faults. Event logging is a mechanism for on-site observation of internal FibreBridge behavior such as tracing SCSI commands received over the Fibre Channel from the host and return of data and status to the host. Any commands which require Ethernet are not available for ATTO FibreBridge 1180 models. Refer to the [CLI summary reference](#) on page 41 to determine which CLI commands apply to your model.*

### AutoLogSense

*Controls Automatic LOG SENSE functions.*

Default: disabled

Set syntax: set AutoLogSense [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get AutoLogSense

### BridgeModel

*Reports model information about the FibreBridge 2400.*

*For other Fibre Bridge models, refer to*

*[FibreBridgeModel](#) on page 48.*

Information only: get BridgeModel

### BridgeName

*Specifies the eight-character name assigned to the FibreBridge 2400 used to identify individual FibreBridge units. It is not the World Wide Name. The string is alphanumeric, eight characters long. For other Fibre Bridge models, refer to [FibreBridgeName](#) on page 48.*

Default: “ “

Set syntax: set BridgeName [value]

Requires a SaveConfiguration command

Get syntax: get BridgeName

### ClearEventLog

*Clears the contents of the event log. No new entries will be recorded until ClearEventLog has completed.*

Immediate: ClearEventLog

### ClearTraceLog

*Clears the contents of the trace log. No events will be recorded until the command has been completed.*

Immediate: ClearTraceLog

### DispFcPortDB

*Displays a table containing the WWNs of all known devices in the FC network and their associated loop IDs. This command is only valid when initiator mode is enabled. See the CLI command FcInitiator.*

Immediate: DispFcPortDB <fp>

### DisplayEventLog

*Displays the most recent page of event log entries. Typing a +, - or = causes the next, previous or same page of event log entries to be displayed. No events will be recorded until the command has been completed. Type <q> to disable the command, begin new log entries, and return to CLI.*

Immediate: DisplayEventLog < + | - | = | q >

### DisplayEventLogFilter

*Filters the display of data for specific FibreBridge subsystems when in DisplayEventLog mode. If enabled for a particular subsystem and level, that subsystem and level will be masked when the command*

*DisplayEventLog is issued.*

Subsystem entries:

ENET  
XCOPY  
NVRAM  
PERF  
ECC  
GEN

Parity

Error

ALL

Default: all all disabled

Set syntax: set DisplayEventLogFilter [subsystem] [level]  
[enabled | disabled]

Get syntax: get DisplayEventLogFilter [subsystem] [level]

### DisplayTraceLog

*Displays the most recent page of trace log entries. Typing a +, - or = causes the next, previous or same page of trace log entries to be displayed. No events will be recorded until the command has been completed. Type <q> to disable the command, begin new log entries, and return to CLI.*

Immediate: DisplayTraceLog < + | - | = | q >

## DisplayTraceLogFilter

*Filters the display of data in the trace log. when in DisplayTraceLog mode. If enabled for a particular subsystem and level, that subsystem and level will be masked when the command DisplayTraceLog is issued. To display all values, type **all all** as parameters.*

Default: disabled

Set syntax: set DisplayTraceLogFilter [FC | SCSI | ALL]  
[fp | sb | ALL] [enabled | disabled]

Get syntax: get DisplayTraceLogFilter [FC | SCSI | ALL]  
[fp | sb | ALL]

## DumpEventLog

*Dumps the contents of the entire event log to the current CLI session without impact on the log itself (the log is not cleared). No events will be recorded until the command has been completed.*

Immediate: DumpEventLog

## DumpTraceLog

*Dumps the contents of the entire trace log to an RS-232 or Telnet session over Ethernet without impact on the log itself. (the log is not cleared). No events will be recorded until the command has been completed.*

Immediate: DumpTraceLog

## EccLog

*ECCLog contains the Error Correcting Code statistics since the previous statistics were last cleared. The maximum number of errors is 65535. Get form shows the statistics. The set form sets the statistics to zero.*

Set syntax: set EccLog clear

Get syntax: get EccLog

## ErrorLog

*Records various system errors to the errorlog. The set version clears all previous entries.*

Systems: 960, Static Memory, Synchronous DRAM, ISP2200, Software

Set syntax: set ErrorLog clear

Get syntax: get ErrorLog

## EventLog

*When enabled, records various system errors to the eventlog.*

Default: enabled

Set syntax: set EventLog [enabled | disabled]

Get syntax: get EventLog

## EventLogFilter

*Filters the display of data for specific FibreBridge subsystems when in EventLog mode. If enabled for a particular subsystem and level, that subsystem and level will be masked when the command EventLog is issued. To display all values, type **all all** as parameters.*

Subsystem entries:

ENET

XCOPY

NVRAM

PERF

ECC

GEN

Parity

Error

ALL

Log level entries:

INFO

WARN

CRIT

FAIL

ALL

Default: all all disabled

Set syntax: set EventLogFilter [subsystem] [level]  
[enabled | disabled]

Get syntax: get EventLogFilter [subsystem] [level]

## FcPortList

*Returns a list of available FC ports and their current status. Valid status values are OK and Failed.*

Immediate: FcPortList

## FcSCSIBusyStatus

*Specifies the SCSI status value returned when the FibreBridge is unable to accept a SCSI command because of a temporary lack of resources. Choices are busy and qfull.*

Default: busy

Set syntax: set FcSCSIBusyStatus [busy | qfull]

Requires a SaveConfiguration command

Get syntax: get FcSCSIBusyStatus

## FCTargets

*Obtains information about every FC target device visible to a FibreBridge operating in initiator mode; devices may be used as targets for initiator mode features such as Extended Copy. The CLI command FcInitiator must be enabled*

Immediate: FcTargets

## FcWWName

*Reports the Word Wide Name (WWN) of the FC interface. Each FC port has an individual and unique WWN. The least significant 3 bytes of the WWN are used as the Ethernet MAC address. The lower nibble of the highest byte designates the port number.*

Information only: get FcWWN [PortNumber]

## FibreBridgeModel

*Reports model information about a specific FibreBridge*

Information only: get FibreBridgeModel

## FibreBridgeName

*Specifies the eight-character name assigned to the FibreBridge used to identify individual FibreBridge units. It is not the World Wide Name. The string is alphanumeric, eight characters long.*

Set syntax: set FibreBridgeName [value]

Requires a SaveConfiguration command

Get syntax: get FibreBridgeName

## FixedLengthReqSense

*Specifies that the FibreBridge will pad the number of autosense data returned as a result of a **CHECK CONDITION** to a **mod 4** length.*

Default: disabled

Set syntax: set FixedLengthReqSense [ enabled | disabled]

Get syntax: get FixedLengthReqSense

## Help

*Displays a list of available commands. If command name is specified, displays detailed command-specific information.*

Immediate: Help [command name]

## IdentifyBridge

*Enabling this option causes the Ready LED on the front panel of the FibreBridge to blink until the parameter is disabled.*

Set syntax: set IdentifyBridge [enabled | disabled]

Get syntax: get IdentifyBridge

## IdentifyFibreBridge

*Enabling this option causes the Ready LED on the front panel of the FibreBridge to blink until the parameter is disabled.*

Set syntax: set IdentifyFibreBridge [enabled | disabled]

Get syntax: get IdentifyFibreBridge

## Info

*Displays version numbers and other production information for key components within the FibreBridge*

Immediate: Info

## ParityLog

*Contains the parity error statistics for the FibreBridge since the statistics were last cleared. The set form sets the*

*statistics to zero. Choice 65,535 maximum number of errors*

Set syntax: set ParityLog clear

Get syntax: get ParityLog

## Performance

*Returns the performance data for the FC port you specify. Data includes the average rate (MB per sec.) and number of I/Os measured over the previous sampling period where a sampling period is approximately one second. Requesting performance data for an FC port which has been disabled or has failed will result in the display of an error message ("ERROR Disabled Fibre Channel port" or "ERROR Failed Fibre Channel port"). Reported performance may be affected by FC port and SCSI bus availability and saturation, SCSI device speeds and overall system use.*

Information only: get Performance <fp>

## SCSIPortList

*Returns a list of available SCSI ports and their current status. Valid status values are **OK** and **Failed**.*

Immediate: SCSIPortList

## SCSITargets

*Returns a list of SCSI devices operational on the referenced SCSI port with SCSI target number, SCSI LUN number, device type, vendor ID, product ID, revision and serial number. Also for all models except the FibreBridge 2400, updates the status of any 'online' maps/routes to 'unavailable' if a device is not found or 'online' if a device is found.*

Information only: SCSITargets [sb]

## SerialNumber

*Reports the FibreBridge serial number which is unique for each FibreBridge. The serial number tracks the board throughout its life and should not be changed for any reason. Set form requires operator privileges.*

Information only: get SerialNumber

## SNMPDumpMIB

*Dumps the contents of the private ATTO FibreBridge SNMP MIB to the current CLI session. Contact your system administrator for help.*

Immediate command: SNMPDumpMIB

## SNMPTrapAddress

*Sets/displays the IP trap addresses and levels.*

Index: value between 1 and 6

IP Address: standard IP address

Trap Level: severity required for an event to trigger a trap:

None: no traps will be sent to the address

ALL: all triggering events will be sent

Informational: a trap will be issued to the given address

Warning: warning and critical events will be sent

Critical: only critical events will trigger a trap

Set syntax: set SNMPTrapAddress [Index] [IPAddress]  
[level]

Get syntax: get SNMPTrapAddress

## SNMPTraps

*Enables/disables SNMP trap functions.*

Default: disabled

Set syntax: set SNMPTraps [enabled | disabled]

Get syntax: get SNMPTraps

## SNMPExtendedTraps

*Enables/disables extended traps such as device transition and device error. Not available for the FibreBridge 2400.*

Default: disabled

Set syntax: set SNMPExtendedTraps [enabled|disabled]

Get syntax: get SNMPExtendedTraps

## Temperature

*Returns the current internal temperature of the unit in degrees Celsius.*

Information only: get Temperature

## TraceLog

*When enabled, records various aspects of the FC-SCSI traffic it receives to the trace log.*

Default: disabled

Set syntax: set TraceLog [enabled | disabled]

Get syntax: get TraceLog

## TraceLogFilter

*Filters the display of data for specific FibreBridge subsystems when in TraceLog mode. If enabled for a particular subsystem and level, that subsystem and level will be masked when the command TraceLogFilter is issued.*

Default: disabled

Set syntax: set TraceLogFilter [FC | SCSI | ALL] [fp |sb | ALL] [enabled | disabled]

Get syntax: get TraceLogFilter [FC |SCSI |ALL ] [fp |sb | ALL ]

## Voltage

*Displays the voltage levels monitored by the FibreBridge 2350 and the FibreBridge 2400.*

VCC: +5.03 V

VDDA: +3.31 V

VDDDB: +2.49 V

VDDC: +1.5V

VDDD: +1.35V

ALL: all monitored voltages

Information only: get Voltage <VCC | VDDA |VDDDB |ALL>

## WrapEventLog

*When enabled, the FibreBridge will log up to 2,048 event entries before wrapping (overwriting the first entries). If disabled, the FibreBridge stops logging event entries when the buffer is full.*

Default: enabled

Set syntax: set WrapEventLog [enabled | disabled]

Get syntax: get WrapEventLog

## WrapTraceLog

*When enabled, the FibreBridge will log up to 2,048 trace entries before wrapping (overwriting the first entries). If disabled, the FibreBridge stops logging trace entries when the buffer is full.*

Default: enabled

Set syntax: set WrapTraceLog [enabled | disabled]

Get syntax: get WrapTraceLog

## XCDevices

*Allows the user to get information about the devices used in a particular Extended Copy command specified by the CmdNumber as presented in the XCStatus CLI command (see below). DeviceType displays SCSI device type. VendorId, Product Id, SerialNumber display SCSI inquiry data for each device. DataDirection specifies whether a device is a data source, a data destination or both.*

Information only: get XCDevices [CmdNumber]

**XCError**

*Retrieves any SCSI sense data returned by an Extended Copy command because of an error. CmdNumber is the data returned by the XCstatus command (see below). SCSI Status, SenseKey, ASC and ASCQ fields display the sense data returned by the Extended Copy command. If a device also returns sense data, the device's serial number will be displayed in the DeviceId field; its data will be displayed in the DStat, DSK, DASC and DASCQ fields. Any field that does not contain valid data will be filled in with 00.*

Information only: get XCError [CmdNumber]

**XCStatus**

*Polls the status of Extended Copy commands issued to the FibreBridge. CmdNumber is unique identifier for a particular command. ListId displays List ID specified in the CDB of the extended copy command. HostId field displays 8-byte Node Name of FC host that issued Extended Copy command. Status indicates current state of Extended Copy command. Initializing Active, Done or Error. Transferred displays the amount of data transferred in megabytes.*

Information only: get XCStatus

## 2.5.4 Maintenance commands

The CLI commands outlined in this chapter may be used to get information or perform functions which are used in a variety of situations with the ATTO FibreBridge. Any commands which require Ethernet are not available for ATTO FibreBridge 1180 models. Refer to the [CLI summary reference](#) on page 41 to determine which CLI commands apply to your model.

### Date

Sets/displays the date. The range is 01/01/2000 to 12/31/2099. For all models except the FibreBridge 2350, the date will be reset to the default after the FibreBridge is reset or power-cycled. The date is persistent in the FibreBridge 2350 because it has a battery backup.

Default: 01/01/2000

Set syntax: set Date [MM] / [DD] / [YYYY]

Requires a SaveConfiguration command

Get syntax: get Date

### FirmwareRestart

Causes the FibreBridge to reboot, then re-initialize its firmware.

Immediate: FirmwareRestart

### FixedLengthReqSense

If enabled, forces the FibreBridge to pad the number of bytes of autosense data returned as a result of a CHECK CONDITION to a mod 4 length.

Default: disabled

Set syntax: set FixedLengthReqSense [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get FixedLengthReqSense

### IsReserved

Displays the reservation status of the current FibreBridge session/interface.

Immediate command: IsReserved

### MaxOpTemp

Sets/displays the maximum enclosure temperature alarm of the unit in degrees Celsius. If the temperature of the FibreBridge rises above the maximum MaxOpTemp, thermal control event handling occurs. Valid entries are between 55 and 70 degrees

Default: 70° C

Set syntax: set MaxOpTemp [55-70]

Requires a SaveConfiguration command

Get syntax: get MaxOpTemp

### MinOpTemp

Sets/displays the minimum enclosure temperature alarm of the unit in degrees Celsius. If the temperature of the FibreBridge falls below the minimum MinOpTemp, thermal control event handling occurs. Valid entries are between 0 and 15 degrees

Default: 0° C

Set syntax: set MinOpTemp [0-15]

Requires a SaveConfiguration command

Get syntax: get MinOpTemp

### OpTempWarn

Sets/displays the number of degrees in Celsius before a thermal control event handling occurs. Warnings will be made via SNMP traps and system log entries. Valid entries are between 0 and 15 degrees

Default: 5° C

Set syntax: set OpTempWarn [0-15]

Requires a SaveConfiguration command

Get syntax: get OpTempWarn

### Reserve

Prevents other CLI sessions from modifying the FibreBridge. When the FibreBridge services interface is reserved, set commands are unavailable but get commands are available. At least one service interface always has access to the FibreBridge at all times. This interface always reports **RELEASED** status, since it may issue set commands. Reservation of the FibreBridge is implicit: if the configuration is changed by any user of CLI sessions, the FibreBridge becomes **RESERVED**. Executing a **SaveConfiguration** command, **RestoreConfiguration** or **FirmwareRestart** releases the FibreBridge so that other devices may modify it.

Immediate: Reserve

### RestoreConfiguration

Restores configuration to either the default configuration or the configuration last saved into non-volatile memory. The saved option will undo any changes made since the last save.

Immediate: RestoreConfiguration [Default | Saved]

## SCSIPortReset

*Resets the specified SCSI bus.*

Immediate: SCSIPortReset [sb]

## SNTP

*Sets/gets the SNTP setting. When enabled, the FibreBridge will try, at reset and every 12 hours thereafter, to contact a specified SNTP time server to initialize/synchronize the time.*

Default: enabled

Set syntax: set SNTP [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get SNTP

## SNTPServer

*Sets/gets the IP address of the SNTP time server. If the FibreBridge is unable to contact the specified SNTP time server within 30 seconds, the FibreBridge will try to contact the first auxiliary SNTP time server. If not successful, the FibreBridge will try to contact the second auxiliary server. If not successful, the FibreBridge will continue to keep time based on the most recent SNTP time server, physical RTC or manual initialization or synchronization*

Auxiliary time servers included:

129.6.15.28 (time-a.nist.gov)

132.163.4.101 (time-a.timefreq.blrdoc.gov)

Default: 192.43.244.18 (time.nist.gov)

Set syntax: set SNTPServer xxx.xxx.xxx.xxx

Requires a SaveConfiguration command

Get syntax: get SNTPServer

## SpeedWrite

*SpeedWrite is a method to improve the performance of FCP WRITE commands to SCSI devices attached to the FibreBridge. You can specify the SCSI bus, target and LUN of a mapped device or specify "all" to set or get the state of all currently mapped SCSI devices.*

Default: all disabled

Set syntax: set SpeedWrite [sb st sl | all] [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get SpeedWrite [sb st sl | all]

## SpeedWriteDefault

*Specifies the state of SpeedWrite for any SCSI devices mapped manually or via an AutoMap operation. If enabled, any new SCSI device will use SpeedWrite performance enhancement by default.*

Default: disabled

Set syntax: set SpeedWriteDefault [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get SpeedWriteDefault

## Time

*Sets/displays the time in a 24-hour format. The default time is 00:00:00 and is accurate until the FibreBridge is reset or power-cycled when it returns to the default.*

Default: 0:00:00

Set syntax: set Time [HH] : [MM] : [SS]

Requires a SaveConfiguration command

Get syntax: get Time

## TimeZone

*Sets/displays the time zone if SNTP is disabled. Setting may be EST, CST, MST PST or a numerical offset from GMT in the format +/- HH:MM. When SNTP is enabled, applies the time zone setting to the time retrieved from a specified SNTP time server to determine local time.*

Default: EST

Set syntax: set TimeZone [EST | CST | MST | PST | [+ / - HH : MM]]

Requires a SaveConfiguration command

Get syntax: get TimeZone

## Zmodem

*Allows transfer of a firmware image to or from the FibreBridge using the ZMODEM file transfer protocol. Available only through the RS232 interface.*

Immediate: Zmodem [Send filename | Receive]



### CAUTION

**After a firmware image is downloaded to the FibreBridge, the image is placed into flash memory. During this time (about 30 seconds), DO NOT remove power to the FibreBridge or the flash may become corrupted.**



## 2.5.5 SCSI configuration commands

The SCSI ports are configured with default settings but may be customized to your specifications using the CLI commands in this section. Any commands which require Ethernet are not available for ATTO FibreBridge 1180 models. Refer to the [CLI summary reference](#) on page 41 to determine which CLI commands apply to your model.

### AutoLogSense

Controls Automatic LOG SENSE functionality.

Default:

Set syntax: set AutoLogSense [enabled|disabled]

Requires a SaveConfiguration command

Get syntax: get AutoLogSense

### FcSCSIBusyStatus

Specifies the SCSI status value returned when the FibreBridge is unable to accept a SCSI command because of a temporary lack of resources. Choices are busy and qfull.

Default: busy

Set syntax: set FcSCSIBusyStatus [busy | qfull]

Requires a SaveConfiguration command

Get syntax: get FcSCSIBusyStatus

### FixedLengthReqSense

Specifies that the bridge will pad the number of bytes of autosense data returned as a result of a CHECK Condition to a "mod 4" length.

Set stands: set FixedLengthReqSense [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get FixedLengthReqSense

### SCSIInitID

Specifies or reports the SCSI initiator ID on the specified SCSI port as found in NVRAM. All maps coinciding with the user-specified SCSIInitID must be set to offline and will become invalid upon issuing this command. The set command always modifies NVRAM, whether you use a **SaveConfiguration** command or not.

Default: 7

Set syntax: set SCSIInitID [sb [0-15] ]

Get syntax: get SCSIInitID

### SCSIInitID (FB 2400 only)

Specifies or reports the SCSI initiator ID on the specified SCSI port as found in NVRAM. All maps coinciding with the user-specified SCSIInitID will be destroyed after the command is issued.

Default: 7

Set syntax: set SCSIInitID [sb [0-15] ]

Get syntax: get SCSIInitID

### SCSIPortBusSpeed

Controls the transfer rate at which the FibreBridge will attempt to negotiate with its SCSI devices. Valid options are Fast SCSI, Ultra SCSI, Ultra 2 SCSI, Ultra 3 SCSI and Ultra 4 SCSI. Ultra2 and Ultra 3 are valid only if FibreBridge has LVD-capable SCSI ports. The FibreBridge 1180 only supports Ultra2 or slower speeds; all other FibreBridge models also support higher speeds.

Default: see [CLI summary reference](#) on page 41

Set syntax: set SCSIPortBusSpeed [Port Number [ fast | ultra | ultra2 | ultra3 | ultra4 ]

Requires a SaveConfiguration command

Get syntax: get SCSIPortBusSpeed

### SCSIPortList

Returns a list of available SCSI ports and their current status. Valid status values are OK and Failed

Get syntax: SCSIPortList

### SCSIPortReset

Resets the specified SCSI bus.

Set syntax: SCSIPortReset [sb]

### SCSIPortResetOnStartup

Specifies if the SCSI port should be reset on power-up.

Default: enabled

Set syntax: set SCSIPortResetOnStartup [sb [enabled | disabled] ]

Requires a SaveConfiguration command

Get syntax: get SCSIPortResetOnStartup [sb]



### **SCSIPortSelTimeout**

*Indicates the time, in milliseconds, that the bridge waits for a response from a SCSI device on the selected port after a selection request. Setting a long selection time-out value can result in the host generating system time-out. Choices are 256, 128, 64, 32, 16, 8, 4, 2 or 1 milliseconds*

Default: 256 milliseconds

Set syntax: set SCSIPortSelTimeout [sb [ 256 | 128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 ]]

Requires a SaveConfiguration command

Get syntax: get SCSIPortSelTimeout [sb]

### **SCSIPortSyncTransfer**

*Specifies whether synchronous SCSI transfers should be negotiated with devices on the specified SCSI port.*

Default: enabled

Set syntax: set SCSIPortSyncTransfer [[sb [enabled | disabled] ]

Requires a SaveConfiguration command

Get syntax: get SCSIPortSyncTransfer [sb]

### **SCSIPortTaggedQueuing**

*Specifies whether tagged command queuing is allowed on the SCSI port. Enabled allows tagged commands for maximum performance*

Default: enabled

Set syntax: set SCSIPortTaggedQueuing [sb [ enabled | disabled ]]

Requires a SaveConfiguration command

Get syntax: get SCSIPortTaggedQueuing [sb]

### **SCSIPortTermination**

*FibreBridge 2400 only: Configures/reports the SCSI internal termination of the SCSI port identified on the FibreBridge 2400.*

Default: enabled

Set syntax: set SCSIPortTermination [sb] [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get SCSIPortTermination [sb]

### **SCSIPortWideTransfer**

*Specifies whether wide SCSI transfers should be negotiated. Enabled allows wide transfer negotiation*

Default: enabled

Set syntax: set SCSIPortWideTransfer [sb [ enabled | disabled ]]

Requires a SaveConfiguration command

Get syntax: get SCSIPortWideTransfer [sb]

### **SCSITermination**

*Configures/reports the SCSI internal termination of the SCSI port identified.*

Default: enabled

Set syntax: set SCSITermination [sb [enabled | disabled] ]

Requires a SaveConfiguration command

Get syntax: get SCSITermination [sb]

### **SpeedWrite**

*When enabled, improves the performance of FCP WRITE commands to SCSI devices attached to the FibreBridge. Specify SCSI bus (sb), target (st), LUN (sl) of a mapped SCSI device or (all) for each currently mapped device*

Set syntax: set SpeedWrite [sb st sl | all] [enabled | disabled ]

Get syntax: get SpeedWrite [sb st sl | all]

### **SpeedWriteDefault**

*When enabled, SpeedWrite performance enhancement is set as the default for any subsequent SCSI devices mapped manually or via an AutoMap operation. If disabled, the FibreBridge will not attempt SpeedWrite performance enhancement to newly-mapped SCSI devices.*

Set syntax: set SpeedWriteDefault [enabled | disabled]

Get syntax: get SpeedWriteDefault

### **VirtualDriveResponse**

*Virtual Drive Response allows the FibreBridge to provide proxy responses to SCSI INQUIRY and TEST UNIT READY commands if a SCSI device is in a timeout or busy. Host systems may then assign devices consistently despite the device's state during execution of the SCSI commands.*

Default: disabled

Set syntax: set VirtualDriveResponse [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get VirtualDriveResponse

## 2.5.6 Fibre Channel configuration commands

*The Fibre Channel ports are configured with default settings but may be customized using CLI. Any commands which require Ethernet are not available for ATTO FibreBridge 1180 models. Refer to the [CLI summary reference](#) on page 41 to determine which CLI commands apply to your model.*

### BootFibreDelay

*Initialization of the FC port is delayed by 0, 15 or 30 seconds to allow a connected Fibre switch to fully initialize before enabling the FibreBridge FC ports.*

Default: 0 (no delay)

Set syntax: set BootFibreDelay [0 | 15 | 30 ]

Requires a SaveConfiguration command

Get syntax: get BootFibreDelay

### BootScan

*Provides dynamic mapping of SCSI devices to the Fibre port/LUN combination via a SCSI bus scan at boot time. All devices discovered during the bus scans will be assigned to a Fibre port, Fibre LUN combination until the next reset/power cycle. This dynamic mapping will replace the current, static mapping of the FibreBridge.*

Default: disabled

Set syntax: set BootScan [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get BootScan

### BootScanPorts

*For legacy applications, selects/displays the ports to be used for a boot scan.*

Default: auto

Set syntax: set BootScanPorts [fp | all | auto]

Requires a SaveConfiguration command

Get syntax: get BootScanPorts

### DispFcPortDB

*Used to display the contents of the specified FC port's internal port database if the command **FCInitiator** is enabled. The database contains FC addressing information for each FC target device visible to the FibreBridge.*

Information only: DispFcPortDB <fp>

### FcAck0

*Specifies whether ACK0 or ACK1 will be returned in response to a Class 2 FC data frame or sequence. Enable sends ACK0 at the end of a sequence. Disable returns an ACK1 frame for each data frame.*

Default: disabled

Set syntax: set FcAck0 [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get FcAck0

### FcClass2

*Specifies if the FibreBridge will support FC Class 2 (multiplexed) service. The FibreBridge uses Class 3 service by default.*

Default: disabled

Set syntax: set FcClass2 [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get FcClass2

### FcConnMode

*Controls/reports the connection mode the FibreBridge uses when communication across a FC network, either to an arbitrated loop (FC-AL) when you select loop mode, or point-to-point when you choose ptp.*

Default: loop

Set syntax: set FcConnMode [loop | ptp]

Requires a SaveConfiguration command

Get syntax: get FcConnMode

### FcDataRate

*Specifies the rate the FibreBridge will use, 1 Gigabit/sec., 2 Gigabit/sec. 4 Gigabit/sec. or auto negotiate.*

Default: auto

Set syntax: set FcDataRate [1Gb | 2Gb | 4Gb | auto]

Requires a SaveConfiguration command

Get syntax: get FcDataRate

### **FcFairArb**

*Turns the FC Arbitrated Loop (FC-AL) arbitration fairness on or off. When enabled, the FibreBridge follows the arbitration fairness rules on the FC-AL.*

Default: enabled

Set syntax: set FcFairArb [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get FcFairArb

### **FcFullDuplex**

*When enabled, allows full duplex FC communication between the FibreBridge and other FC devices. Disable FcFullDuplex results in half duplex mode.*

Default: enabled

Set syntax: set FcFullDuplex [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get FcFullDuplex

### **FcHard**

*Used to enable or disable FC hard address assignment. Under soft addressing, the FibreBridge loop address is assigned during loop initialization. Use FcHardAddress (described below) if you enable hard addressing.*

Default: disabled

Set syntax: set FcHard [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get FcHard

### **FcHardAddress**

*Sets/displays the value used as the FC-AL hard address. This hexadecimal value represents the address the FibreBridge will try to use if hard addressing is enabled. When an optional address is not present, the current value is displayed. The valid range of values is 0 through 125.*

Set syntax: set FcHard Address [fp | [address]]

Requires a SaveConfiguration command

Get syntax: get FcHardAddress [fp]

### **FcInitiator**

*Allows FibreBridge to operate as an initiator on the FC network, an attribute required for features such as Extended Copy to locate and send commands to FC devices.*

Set syntax: set FcInitiator [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get FcInitiator

### **Fcp2**

*Allows compliance with the FCP-2 FC specification, for the FibreBridge 1290 only.*

Default: disabled

Set syntax: set Fcp2 [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get Fcp2

### **Fcp2Conf**

*Requests FCP\_CONF IUs when FCP-2 support is also enabled for the FibreBridge 1290. The command is valid only when FCP-2 support enabled.*

Default: disabled

Set syntax: set Fcp2Conf [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get Fcp2Conf

### **Fcp2CRN**

*The FibreBridge 1290 will accept CRNs for precise delivery of SCSI commands when FCP-2 support is also enabled. Command is valid only when FCP-2 support enabled.*

Default: disabled

Set syntax: set Fcp2CRN [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get Fcp2CRN

## FCPortFailover

Controls the current operating mode of FC ports on the bridge. When disabled, all FC ports are active. When enabled, a designated FC port is marked as reserved and becomes active only if a port fails. If a failure occurs, the failover port takes on the identity of the failed port. If enabled, all device maps on the designated failover port will be deleted.

Default: disabled

Set syntax: set FCPortFailover [enabled | disabled]

Get syntax: get FCPortFailover

## FcPortList

Returns a list of available FC ports and their current status. Valid status values are **OK** and **Failed** for all FibreBridge models, and **Reserved** for the FibreBridge 2400.

Immediate: FcPortList

## FCPortRecover

Attempts to restore a bridge that has experienced a failover to its pre-failover state.

Immediate: FCPortRecover

## FCSCSIBusyStatus

Specifies the SCSI status value returned when the FibreBridge is unable to accept a SCSI command because of a temporary lack of resources. Choices are busy and queue full.

Default: busy

Set syntax: set FcSCSIBusyStatus [busy | qfull]

Requires a SaveConfiguration command

Get syntax: get FcSCSIBusyStatus

## FcTargets

Obtains information about every FC target device visible to a FibreBridge operating in initiator mode; devices may be used as targets for initiator mode features such as Extended Copy.

Get syntax: FcTargets

## FcWWName

Reports the Word Wide Name (WWN) of the FC interface. Each FC port has an individual and unique WWN. The least significant 6 bits of the WWN are used as the Ethernet MAC address. Fabric and loop operations are unpredictable if duplicate WWNs are assigned.

Information only: get FcWWN [PortNumber]

## FibreBridgeTargetLUN

Specifies the soft target LUN(s) to be used by the FibreBridge when addressed by the host as a SCSI device. Any map coinciding with the user-specified FcTargets LUN must first be set to offline before trying to change it. This map will be destroyed upon power-cycling the FB. Disabling a FibreBridgeTargetLUN for a particular FC port will destroy the map for that port. The get form reports all FB Target LUNs currently NOT disabled. Specifying a port returns the status of that port. Valid entries [fl] are 0 to 63.

Set syntax: set FibreBridgeTargetLUN [[fp] [fl] | [disabled]]

Requires a SaveConfiguration command

Get syntax: get FibreBRidgeTargetLUN [fp]

## Performance

Returns the performance data for the FC port you specify. Data includes the average rate (MB per sec.) and number of I/Os measured over the previous sampling period. A FC port which has been disabled or has failed will prompt an error message. Reported performance may be affected by FC port and SCSI bus availability and saturation, SCSI device speeds and overall system use.

Information only: get Performance [fp]

## ServicesLUN

Sets and displays the Services LUN for the specified FC port. Valid ServicesLUN entries are 0 through (n-1) where n equals the number of Fibre Channel ports. Valid entries for fl are 0-63. Any map coinciding with a user-specified ServicesLUN must be set to offline before trying to change a ServicesLUN.

Default: 0x08

Set syntax: set ServicesLUN [ [ fp] [ fl ] | [disabled] ]

Requires a SaveConfiguration command

Get syntax: get ServicesLUN [fp]

## 2.5.7 Serial port configuration commands

*The ATTO FibreBridge serial ports are configured with default settings but may be customized to your specifications using the CLI commands in this section.*

### **SerialPortBaudRate**

*Configures/reports the baud rate for the FibreBridge RS-232 serial port. The number of data bits per character is fixed at 8 with no parity. Choices are 2400, 9600, 19200, 38400, 57600 and 11520*

Default: 9600

FibreBridge 2400 default: 11520

Set syntax: set SerialPortBaudRate [2400 | 9600 | 19200 | 38400 | 57600 | 115200]

Requires a SaveConfiguration command

Get syntax: get SerialPortBaudRate

### **SerialPortEcho**

*Enables/disables/reports the echoing of keyboard input. When enabled, all non-control character keyboard input is output to the display. Local ASCII terminal (or terminal*

*emulator) echo settings should be set to disabled while using SerialPortEcho enabled*

Default: disabled

FibreBridge 2400 default: enabled

Set syntax: set SerialPortEcho [enabled | disabled]

Requires a SaveConfiguration Restart command

Get syntax: get SerialPortEcho

### **SerialPortStopBits**

*Configures/reports the number of stop bits per character for the FibreBridge RS -232 serial port. The number of data bits per character is fixed at 8 with no parity. Choices are 1 or 2.*

Default: 1

Set syntax: set SerialPortStopBits [1 | 2]

Requires a SaveConfiguration command

Get syntax: get SerialPortStopBits

## 2.5.8 Ethernet configuration commands

*The Ethernet configuration commands configure the Ethernet and TCP/IP parameters. Any commands which require Ethernet are not available for ATTO FibreBridge 1180 models. Refer to the [CLI summary reference](#) on page 41 to determine which CLI commands apply to your model.*

### AutoLogSense

*Controls Automatic LOG SENSE functions.*

Default: disabled

Set syntax: set AutoLogSense [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get AutoLogSense

### DhcpFixedDelay

*Selects/displays the delay, in seconds, between DHCP client request intervals. 0 time is typical. Choices are 0, 15 or 30 seconds*

Default: 0 (no delay)

Set syntax: set DhcpFixedDelay [ 0 | 15 | 30 ]

Get syntax: get DhcpFixedDelay

### EthernetSpeed

*Sets/displays the current speed of the Ethernet connection. Choices are 10, 100, and Auto.*

Default: auto

Set syntax: set EthernetSpeed [ 10 | 100 | Auto ]

Requires a SaveConfiguration command

Get syntax: get EthernetSpeed

If auto enabled, value in parentheses indicates current speed

### Exit

*Exits the current Ethernet telnet CLI session; it has no effect if used during a serial or in-band CLI session.*

Immediate command: Exit

### IPAddress

*Sets/displays the current FibreBridge IP address. If IPDHCP is enabled (see below), get command reports current IP address assigned by DHCP server. Setting this value always modifies the internal NVRAM value of the IP Address, whether or not a SaveConfiguration is performed.*

Default IP Address: 10.0.0.1

Set syntax: set IPAddress xxx.xxx.xxx.xxx

Get syntax: get IPAddress

### IPDHCP

*Selecting DHCP allows the FibreBridge to request an IP address from the network. The network must have at least one DHCP server.*

Default: disabled

FibreBridge 2400 default: enabled

Set syntax: set IPDHCP [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get IPDHCP

### IPGateway

*Sets/displays the current gateway. If IPDHCP is enabled (see above), get command reports current IP gateway assigned by DHCP server. Setting this value always modifies the internal NVRAM value of the IP Gateway, whether or not a SaveConfiguration is performed. The IP gateway address will be rejected if the FibreBridge IP address is not in the same subnet as the gateway.*

Default: 0.0.0.0

Set syntax: set IPGateway xxx.xxx.xxx.xxx

Get syntax: get IPGateway

### IPSubnetMask

*Sets/displays the current subnet mask. If IPDHCP is enabled (see above), get command reports current subnet mask assigned by DHCP server. Setting this value always modifies the internal NVRAM value of the IP subnet mask whether or not a SaveConfiguration is performed.*

Default: 255.255.0.0

Set syntax: set IPSubnetMask xxx.xxx.xxx.xxx

Get syntax: get IPSubnetMask

## Password

*Specifies password for all non-serial sessions: Telnet, ftp and ExpressNAV user management console. You will be prompted for the current password, to enter the new password, and to confirm the new password. If local Echo is enabled, password will echo all \* characters. In verbose mode only, CLI will request the password be re-entered. When the password is all 0s, Telnet and ftp do not validate the password and MD5 authentication is disabled. Passwords are case sensitive and can be 1-32 characters long with no spaces.*

Default: Password

Set syntax: set Password [ xxx ]

Requires a SaveConfiguration command

## Ping

*Sends an ICMP echo request to the specified host.*

Immediate command: ping [ MPn ] [xxx.xxx.xxx.xxx]  
<count <size>>

## ReadOnlyPassword (FB 2400 only)

*Specifies password for all non-serial sessions: Telnet, ftp and ExpressNAV user management console. An empty password can be configured by not specifying one.*

Default: Password

Set syntax: set ReadOnlyPassword [ xxx ]

Requires a SaveConfiguration command

## ReadOnlyUsername (FB 2400 only)

*Specifies username for all Telnet, ftp and ExpressNAV user management console sessions. Username is case insensitive, 1-32 characters, no spaces.*

Default: User

Set syntax: set ReadOnlyUsername [username]

Requires a SaveConfiguration command

Get syntax: get ReadOnlyUsername

## SNMPDumpMIB

*Dumps the contents of the ATTO custom MIB to the current CLI session.*

Immediate command: SNMPDumpMIB

## SNMPTrapAddress

*Sets/displays the IP trap addresses and levels.*

Index: value between 1 and 6

IP Address: standard IP address

Trap Level: severity required for an event to trigger a trap:

None: no traps will be sent to the address

ALL: all triggering events will be sent

Informational: a trap will be issued to the given address

Warning: warning and critical events will be sent

Critical: only critical events will trigger a trap

Set syntax: set SNMPTrapAddress [Index] [ IPAddress ]  
[level]

Get syntax: get SNMPTrapAddress

## SNMPTraps

*Enables/disables SNMP trap functions.*

Default: disabled

Set syntax: set SNMPTraps [enabled | disabled]

Get syntax: get SNMPTraps

## SNMPExtendedTraps

*Enables/disables extended traps such as device transition and device error. Not available for the FibreBridge 2400.*

Default: disabled

Set syntax: set SNMPExtendedTraps [enabled|disabled]

Get syntax: get SNMPExtendedTraps

## Username

*Specifies username for all Telnet, ftp and ExpressNAV user management console sessions. Username is case insensitive, 1-32 characters, no spaces*

Default: root

Set syntax: set Username [username]

Requires a SaveConfiguration command

Get syntax: get Username

## 2.5.9 Mapping commands

Access to SCSI devices is via Fibre Port and Fibre LUN addresses mapped to SCSI bus, target and LUNs. CLI commands are used to modify the mapping. [Appendix A](#) shows samples of the RouteXxxx command interaction showing actual commands and their output to the Services port. Any commands which require Ethernet are not available for ATTO FibreBridge 1180 models. Refer to the [CLI summary reference](#) on page 41 to determine which CLI commands apply to your model.

### AddressMap

Specifies the address mapping state of the Fibre Channel ports. AddressMap A denotes user-mapped LUN addresses. AddressMap C denotes static LUN addresses. Not available on the FibreBridge 2400.

Default: A

Set syntax: set AddressMap [ A | C ]

Requires a SaveConfiguration command

Get syntax: get AddressMap

### AutoMap

Programmatically maps all currently operational SCSI devices attached to the FibreBridge. Issue a SCSIPortList CLI command before issuing an AutoMap command to scan the bus for operational SCSI buses. Not available on the FibreBridge 2400 if Logical Unit Addressing is enabled.

Immediate: AutoMap [fp]

### DispFCPortDB

Used to display the contents of the specified FC port's internal port database if the command **FCInitiator** has been enabled. The database contains Fibre Channel addressing information for each FC target device visible to the FibreBridge.

Immediate: DispFCPortDB <fp>

### FCConnMode

Controls/reports the connection mode the FibreBridge uses when communication across a Fibre Channel network, either to an arbitrated loop (FC-AL) when you select **loop** mode, or point-to-point when you choose **ptp**.

Default: loop

Set syntax: set FCConnMode [loop | ptp]

Requires a SaveConfiguration command

Get syntax: get FCConnMode

### FCHard

Used to enable or disable Fibre Channel hard address assignment. Under soft addressing, the FibreBridge loop address is assigned during loop initialization. Use **FCHardAddress** (described below) if you enable hard addressing.

Default: disabled

Set syntax: set FCHard [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get FCHard

### FCHardAddress

Sets/displays the value used as the FC-AL hard address. This hexadecimal value represents the address the FibreBridge will try to use if hard addressing is enabled. When an optional address is not present, the current value is displayed. Choices are 0 through 125.

Default: 0x03

Set syntax: set FCHardAddress [ fp | [ address ] ]

Requires a SaveConfiguration command

Get syntax: get FCHardAddress [fp]

### FCPortFailover (FB 2400 only)

Controls the current operating mode of FC ports on the FibreBridge 2400 only. When disabled, all FC ports are active. When enabled, a designated FC port is marked as reserved and becomes active only if a port fails. If a failure occurs, the failover port takes on the identity of the failed port. If enabled, all device maps on the designated failover port will be deleted.

Default: disabled

Set syntax: set FCPortFailover [enabled | disabled]

Get syntax: get FCPortFailover

### FCPortRecover (FB 2400 only)

Attempts to restore a bridge that has experienced a failover to its pre-failover state.

Immediate: FCPortRecover



## FCTargets

*Obtains information about every Fibre Channel target device visible to a FibreBridge operating in initiator mode; devices may be used as targets for initiator mode features such as Extended Copy.*

Immediate: FCTargets

## FibreBridgeTargetLUN

*Specifies the soft target LUN taken from NVRAM to be used by the FibreBridge when addressed by the host as a SCSI device. Any map coinciding with the user-specified FibreBridgeTarget LUN must first be set to offline before trying to change it. This map will be unavailable upon power-cycling the FibreBridge. The get form reports all FibreBridgeTargetLUNs currently NOT disabled.*

*Specifying a port returns the status of that port.*

Set syntax: set FibreBridgeTargetLUN [[fp] [fl] [[disabled]]

Requires a SaveConfiguration command

Get syntax: get FibreBridgeTargetLUN <[fp]>

## LogicalUnitAddressing (FB 2400 only)

*Controls the current device mapping method on the bridge. When disabled, standard peripheral device mapping and formatting is used. Target devices are only made visible to the specific mapped Fibre Channel port. When enabled, static device mapping and formatting is achieved with a discovery bus scan at boot. All target devices are visible to all Fibre Channel ports, with each port sharing a common Fibre Channel Node Name.*

Default: disabled

Set syntax: set LogicalUnitAddressing [enabled|disabled]

Get syntax: get LogicalUnitAddressing

## Route

*Assigns a Fibre Channel address to a target destination device. If you try to map a new SCSI BTL to the same FC LUN, the new BTL will overwrite the previous map. Using the delete identifier instead of SCSI will remove the map from its table. In verbose mode, overwriting an exiting map requires secondary confirmation. Not available on the FibreBridge 2400 if Logical Unit Addressing has been enabled.*

Immediate: Route FC [fp] [fl] [SCSI [sb st sl] Bridge | Delete ]

## RouteChange

*Maps a Fibre Channel port and LUN to a SCSI bus, target and LUN. Attempts to map to a SCSI device currently online results in an error message. Valid entries: fp (0), fl (0-31), sb (0), st (0-15), sl (0-7). Not available on the FibreBridge 2400.*

Immediate: RouteChange [fp] [fl] [sb] [st] [sl]

## RouteDisplay

*Returns a list of currently mapped Fibre Channel-to-SCSI routes sorted by Fibre Channel address and assembled according to the optional parameters specified. Each list is preceded by a count of the lines that immediately follow.*

Valid status values are

**Online:** able to accept SCSI commands

**Unavailable:** no device currently assigned to a particular route; SCSI commands will time-out

**Offline:** rejects any SCSI command

**Going Offline:** RouteOffline has been issued, but queued commands are underway; becomes **Offline** when all queued commands are complete; new SCSI commands sent to a going offline device are rejected

Immediate command: RouteDisplay

**RouteDisplay** displays all current maps

**RouteDisplay[fp]** displays specified FC port maps

**RouteDisplay[online | offline]** displays all maps with online or offline status

**RouteDisplay [fp [fl]]** displays the current map

**RouteDisplay [fp [online | offline]]** displays maps for an FC port with status online or offline

## RouteDisplay (FB 2400 only)

*Displays a list of Fibre Channel to SCSI address mappings on the FibreBridge. If Logical Unit Addressing has been enabled, RouteDisplay shows a list of SCSI to SCSI address mappings.*

Immediate normal mode: RouteDisplay FC <fp> <fl>

Immediate LUA mode: RouteDisplay SCSI <sb> <st> <sl>

## RouteOffline

*Sets a route to **offline** or reports its status as **offline**. Not available on the FibreBridge 2400.*

Set syntax: set RouteOffline [fp] [fl]

Get syntax: get RouteOffline [fp] [fl]

## RouteOnline

*Updates the status of the selected route to **online** if a device is found or **unavailable** if a device is not found at the SCSI address. If route is not currently mapped, command results in an error message. Not available on the FibreBridge 2400.*

Set syntax: set RouteOnline [fp] [fl]

Get syntax: get RouteOnline [fp] [fl]

## SCSIInitID

*Specifies or reports the SCSI initiator ID on the specified SCSI port as found in NVRAM. All maps coinciding with the user-specified SCSIInitID must be set to offline and will become invalid upon issuing this command. The set command always modifies NVRAM, whether you use a **SaveConfiguration** command or not.*

Default: 7

Set syntax: set SCSIInitID [sb [0-15] ]

Get syntax: get SCSIInitID

## SCSIInitID (FB 2400 only)

*Specifies or reports the SCSI initiator ID on the specified SCSI port as found in NVRAM. All maps coinciding with the user-specified SCSIInitID will be destroyed after the command is issued.*

Default: 7

Set syntax: set SCSIInitID [sb [0-15] ]

Get syntax: get SCSI

## SCSITargets

*Returns a list of SCSI devices operational on the referenced SCSI port. Also, for all models except the FibreBridge 2400, updates the status of any online maps/routes to **unavailable** if a device is not found or **online** if a device is found.*

Immediate: SCSITargets [sb]

## ServicesLUN

*Sets and displays the Services LUN for the specified Fibre Channel port. Valid ServicesLUN entries are 0 through (n-1) where n equals the number of Fibre Channel ports. Valid entries for **fl** are 0-63. Any map coinciding with a user-specified ServicesLUN must be set to **offline** before trying to change a ServicesLUN.*

Set syntax: set ServicesLUN [[fp] [fl] | [disabled] ]

Requires a SaveConfiguration command

Get syntax: get ServicesLUN [fp]

## 3.0 Configuring the FibreBridge

*To configure the ATTO FibreBridge through FibreBridge Services, use ATTO ExpressNAV (a browser-based graphical user interface) for all models except the FibreBridge 1180. Use ATTO BridgeTools to configure the FibreBridge 1180. Default values are appropriate for most configurations, but may be modified.*

ATTO FibreBridge Services includes the means to display and modify various attributes of FibreBridge operation, as well as to update firmware. The best way to access FibreBridge Services for all models except the FibreBridge 1180 is to use ATTO ExpressNAV, a browser-based graphical interface. Refer to [ATTO ExpressNAV interface](#) on page 31. ATTO BridgeTools provides a graphical interface for the FibreBridge 1180. Refer to [ATTO BridgeTools for FB1180 only](#) on page 35.

Other methods are also available depending on your FibreBridge model, your operating system, what you want to accomplish, and the method you are using to access FibreBridge Services. Refer to [Using the serial port](#) on page 7.

To use ATTO ExpressNAV you must know the IP address for the FibreBridge. Refer to [Using the Ethernet port](#) on page 5.

After getting an IP address and entering ATTO ExpressNAV, or using ATTO BridgeTools for the FibreBridge 1180 model, you must map devices so that the FibreBridge can access the devices in your network. (Refer to [Mapping](#) on page 67).

Additionally, it is best practice to change the default username and password. Refer to [Optional configurations](#) on page 75.

Several Fibre Channel hosts or initiators may initiate commands through the FibreBridge to SCSI devices. The basic mechanism to resolve possible conflicts among initiators is to use SCSI Reserve and Release commands. For details, refer to [Handling multiple initiators](#) on page 65.

## 3.0.1 Handling multiple initiators

*Several Fibre Channel hosts or initiators may initiate commands through the FibreBridge to SCSI devices. The basic mechanism to resolve possible conflicts among initiators is to use SCSI Reserve and Release commands.*

A Fibre Channel host may need exclusive access to a SCSI device. SCSI **Reserve** and **Release** commands allow logical units to be reserved or released under host control.

The FibreBridge intercepts any Reserve or Release command from a Fibre Channel host, performs initial processing and, if appropriate, relays the Reserve command to the SCSI device.

In a FibreBridge environment, the identity of the initiator (WWN) is not relayed to the SCSI device. A two-step process addresses initiator identity in the FibreBridge, and reserves the SCSI device on behalf of the FibreBridge.

Initiators on both the Fibre Channel (via the FibreBridge) and on the SCSI bus may initiate reserve and release commands to the SCSI devices.

The FibreBridge processing of reserve and release commands involves two tiers of verification. The first tier is within the FibreBridge; the second tier is within the SCSI device.

### General verification procedure

- 1 The FibreBridge receives a SCSI Reserve command.

#### Tier 1

- 2 The FibreBridge determines, via its internal database, whether there are conflicting concurrent reservations from Fibre Channel hosts for the target SCSI device.

- 3 If there is a conflict, the FibreBridge returns a check condition with reservation conflict to the initiator.
- 4 If there is no conflict, the FibreBridge marks the SCSI device as reserved in its internal database.

#### Tier 2

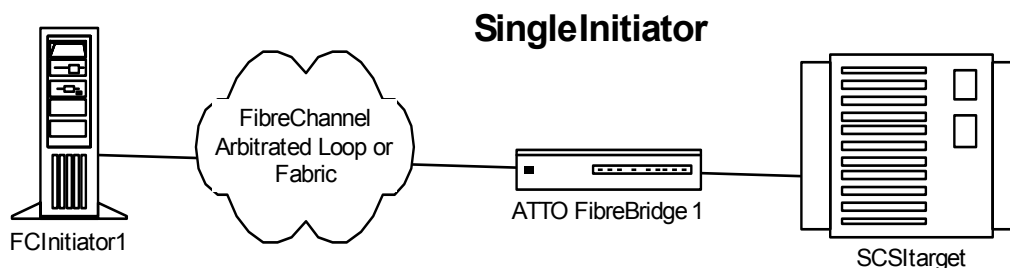
- 5 The FibreBridge relays the **Reserve** command to the SCSI device.
- 6 The SCSI device determines whether it is already reserved.
- 7 If the SCSI device is already reserved, it returns a **reservation conflict** to the FibreBridge. The FibreBridge removes its reserved indicator in its internal database, and returns **reservation conflict** to the initiator.
- 8 If the SCSI device was not previously reserved, the SCSI device is reserved and returns **success** to the FibreBridge. The FibreBridge then returns **success** to the initiator.

The FibreBridge does not implement extent reservation.

### Single initiator

A single initiator presents no conflicts.

- 1 A single Fibre Channel initiator sends the **Reserve** command through the SAN to the FibreBridge
- 2 The FibreBridge determines that no reservation conflict exists at Tier 1.
- 3 The FibreBridge sends the **Reserve** command to the SCSI target.
- 4 The SCSI target is reserved until a **Release** command is sent by the Fibre Channel initiator.



## Multiple Fibre Channel initiators

Multiple Fibre Channel initiators share a Fibre Channel connection on the SAN with a Fibre Bridge, and there are no other initiators on the SCSI bus.

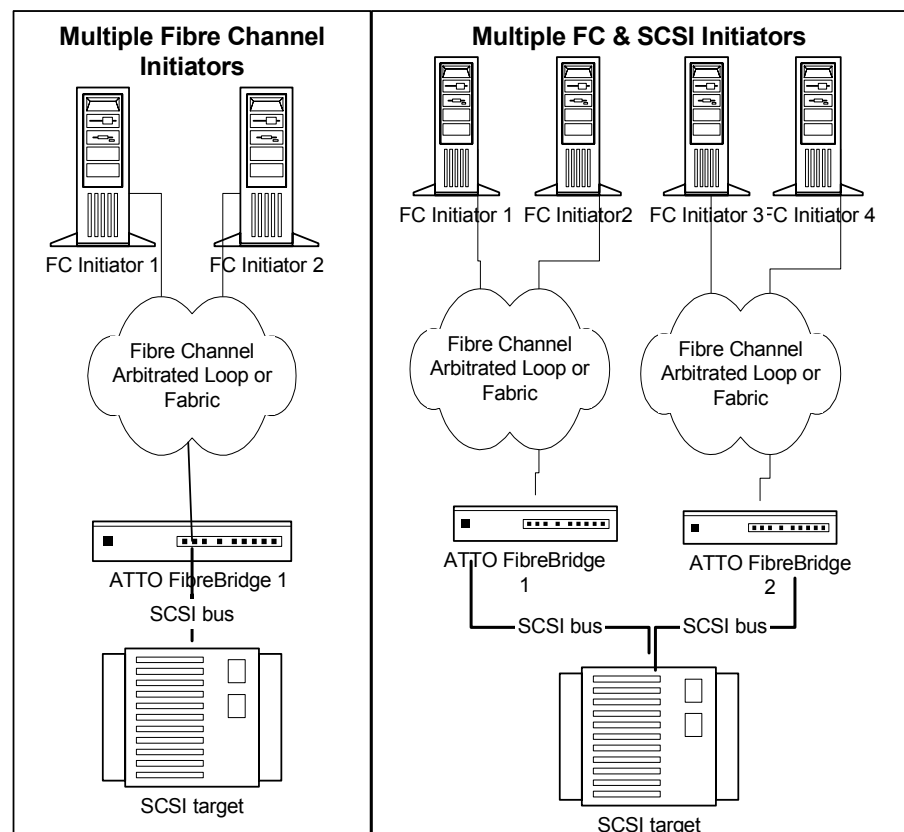
- 1 Fibre Channel Initiator 1 sends the **Reserve** command through the SAN to the FibreBridge.
- 2 The FibreBridge determines that no reservation conflict exists at Tier 1.
- 3 The FibreBridge records the initiator ID (WWN) in its internal database.
- 4 The FibreBridge sends the **Reserve** command to the SCSI target.
- 5 The initiator is notified of reservation success: the SCSI target is reserved.
- 6 Fibre Channel Initiator 2 sends the **Reserve** command through the SAN to the FibreBridge.
- 7 The FibreBridge determines the SCSI device is already reserved.
- 8 The FibreBridge rejects Fibre Channel Initiator 2's command and returns **reservation conflict**.
- 9 The SCSI target remains reserved until a **Release** command is sent by Fibre Channel Initiator 1.

- 3 The FibreBridge records the initiator ID (WWN) in its internal database.
- 4 Fibre Bridge 1 sends the **Reserve** command to the SCSI target.
- 5 The initiator is notified of reservation success: the SCSI target is reserved.
- 6 Fibre Channel Initiator 3 sends the **Reserve** command through the SAN to FibreBridge 2.
- 7 FibreBridge 2 determines that no reservation conflict exists at Tier 1.
- 8 FibreBridge 2 records the initiator ID (WWN) in its internal database.
- 9 FibreBridge 2 sends the **Reserve** command to the same SCSI target.
- 10 The SCSI target is already reserved by FibreBridge 1 and rejects FibreBridge 2's reserve command.
- 11 SCSI Target returns **reservation conflict** to FibreBridge 2.
- 12 FibreBridge 2 removes its internal reserve indicator for the initiator.
- 13 FibreBridge 2 returns **reservation conflict** to Fibre Channel Initiator 3.
- 14 The SCSI target remains reserved by Fibre Channel Initiator 1.

## Multiple FC & SCSI initiators

Several Fibre Channel initiators share a Fibre Channel connection on the SAN with a FibreBridge, and several initiators share the SCSI bus.

- 1 Fibre Channel Initiator 1 sends the **Reserve** command through the SAN to FibreBridge 1 for a SCSI target.
- 2 FibreBridge 1 determines that no reservation conflict exists at Tier 1.



## 3.1 Mapping

*The ATTO FibreBridge allows parallel SCSI devices to participate in a Fibre Channel arbitrated loop or on a fabric. Using ExpressNAV for all models except the FibreBridge 1180 is the easiest way to connect SCSI devices to the Fibre Channel loop or fabric. Use BridgeTools for the FibreBridge 1180.*

To understand more about mapping, refer to [Route addressing](#) on page 69, [Static device addressing](#) on page 71, and [Logical Unit addressing for FB2400 only](#) on page 73.

### Use ExpressNAV (except FB1180)

For all models except the FibreBridge 1180, use the ExpressNAV interface to map devices automatically.

- 1 If not already connected, enter the ExpressNAV interface.
- 2 From the ExpressNAV main menu, click on the **Mapping** menu item on the left side of the screen.
- 3 Click **AutoMap**  
All the CLI commands necessary to enable mapping and the command **saveconfiguration norestart** will be performed.

For greater flexibility map devices manually.

- 1 From the ExpressNAV main menu, click on the **Mapping** menu item on the left side of the screen.
- 2 Select the devices from the box on the right hand side of the screen and drag to the appropriate LUN on the left.
- 3 Click **Submit**. All the CLI commands necessary to enable mapping and the command **saveconfiguration norestart** will be performed.



#### Note

If you have a FibreBridge 2400 and choose to use Logical Unit Addressing as defined in [Logical Unit addressing for FB2400 only](#) on page 73, you cannot use ExpressNAV. Use

the Command Line Interface commands and refer to [Using the serial port](#) on page 7.

### Use BridgeTools (FB 1180)

To map devices on the FibreBridge 1180 automatically, use the Mapping Panel of the ATTO BridgeTools interface.

- 1 Launch BridgeTools (refer to the Installation and Operations Manual for BridgeTools.)
- 2 Open the **Mapping** panel.
- 3 The **Device** window will be empty. Click the **Scan** button at the bottom to instruct the bridge to detect all connected SCSI targets. Information for each SCSI target found will be displayed in a row within the window, including the make and model of the device, the SCSI bus or port of the bridge the device is connected to, and the Target ID and LUN the device is physically set to. Each detected SCSI target will be assigned a LUN and will be mapped to the Fibre Channel port(s) by BridgeTools.
- 4 Select the **Apply** button to make the changes take effect.

If there is an error with the mappings (for example, two targets were assigned the same LUN on the same Fibre port), BridgeTools will display error in the **Status** field of the affected target and a description of the error in the **Message** box at the bottom of the page



#### CAUTION

Unlike modifying the other parameters using BridgeTools, mapping changes take effect immediately after hitting Apply.

- 5 If you want the mapping to persist beyond the current session, save the changes using the **Save/Restore** panel.

Exhibit 3.1-1 Mapping using ATTO ExpressNAV

**ATTO FibreBridge™ 1290**

Hardware ports: Ethernet, SCSI Port 0, SCSI Port 1, FC Port.

**Mapping Interface Components:**

- Powered by ATTO**
- Menu:** HOME, BACK, Status, Ethernet, Serial Port, SCSI, Fibre Channel, Storage, Time & Date, Mapping, Bridge, Advanced, Restart, Help.
- Legend:** Online (Green), Offline (Red), Unmapped (Grey).
- Port 0 Mapping Table:**

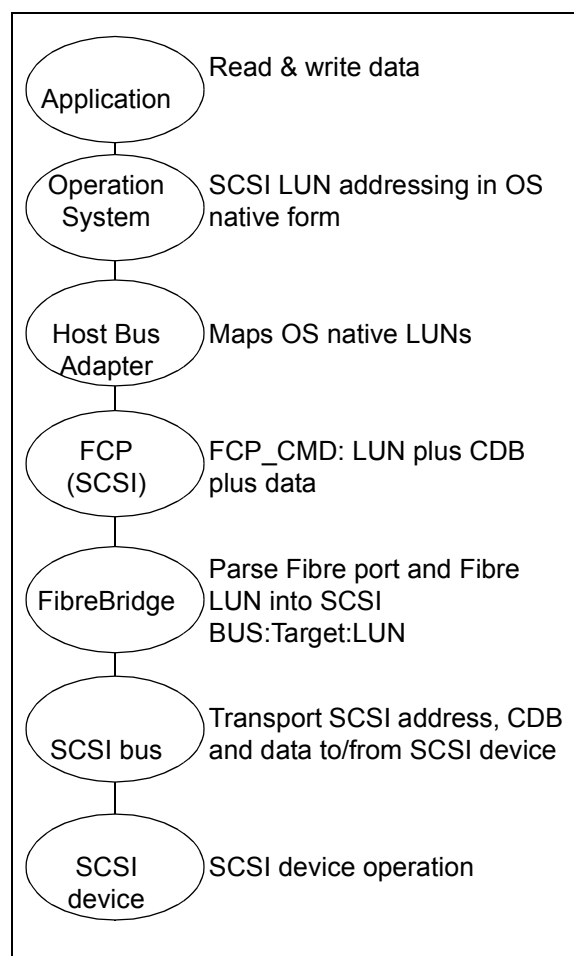
LUN	Device	Status
LUN 0	B:0 T:8 L:0	Online
LUN 1	B:0 T:9 L:0	Online
LUN 2	B:0 T:14 L:0	Online
LUN 3		
LUN 4	Target LUN	
LUN 5	Services LUN	
LUN 6		
LUN 7		
LUN 8		
LUN 9		
LUN 10		
LUN 11		
LUN 12		
LUN 13		
LUN 14		
LUN 15		
- Offline SCSI Devices:**
  - B:0 T:15 L:0
    - Bus: 0
    - Target: 15
    - LUN: 0
    - Device Type: Disk
    - Vendor: SEAGATE
    - Product: ST39204LW
    - Revision: 0002
    - Serial Number: 3BYC6T48000070461KC

The three screenshots show the progression of mapping: 1) Initial state with LUNs 0-2 online. 2) Mapping LUN 3 as 'Target LUN' (Offline) and LUN 4 as 'Services LUN' (Online). 3) Final state with LUN 3 online and LUN 4 as 'Services LUN'.

## 3.1.1 Route addressing

The ATTO FibreBridge allows parallel SCSI devices to participate in a Fibre Channel arbitrated loop or on a fabric. Fibre Channel and parallel SCSI use different models to address devices. The FibreBridge translates between these addressing models.

The chart below is a simplified overview of data and control flow between the application and the SCSI device through a number of stages.



### Fibre Channel World Wide Name (WWN)

The Institute of Electrical and Electronics Engineers (IEEE) assigns each manufacturer a unique Company ID. The Device ID field contains a unique value assigned by ATTO Technology to every Fibre Channel product produced by ATTO Technology.

Each Fibre Channel device is assigned a unique World Wide Name (WWN). The WWN identifies

all Fibre Channel devices. The 64-bit WWN has the following format:

Field Name	WWN Format		Company ID			Device ID		
Byte	0	1	2	3	4	5	6	7
Value	20	00	00	10	86	xx	xx	xx

### Arbitrated Loop Port Address (AL\_PA)

On a Fibre Channel Arbitrated Loop, the FibreBridge appears at a single Arbitrated Loop Port Address (AL\_PA). Each device on an arbitrated loop is assigned a unique AL\_PA during loop initialization. The FibreBridge supports both modes of AL\_PA assignment, commonly referred to as hard and soft addressing.

**Soft addressing** allows the loop initialization master to assign the FibreBridge a unique AL\_PA during the loop initialization process. The AL\_PA assigned cannot be determined before loop initialization. For example, adding new devices to an arbitrated loop may change the AL\_PA assigned to the FibreBridge.

**Hard addressing** allows a predetermined AL\_PA to be assigned to the FibreBridge. The FibreBridge will try to acquire the desired hard AL\_PA. If another device has already been assigned the specified AL\_PA, the FibreBridge will acquire a currently unassigned AL\_PA.

The default mode is soft addressing.

### Addressing devices

SCSI devices connected to the FibreBridge also show up as Fibre Channel LUNs to the host computer. SCSI devices must be on the same addressing level as the SCSI portion of the FibreBridge. The FibreBridge SCSI ID must be set to a different SCSI ID from the other devices on the same bus.



## Manual SCSI device route mapping

Manual mapping allows you to maximize the efficiency of your SCSI devices while allowing greater flexibility.

Using the CLI, you can ask the FibreBridge to find all the SCSI devices on its SCSI bus. With this information you then decide where you want to place these devices. Refer to [Command Line Interface use and guidance](#) on page 39.

In the chart below, the SCSI device on SCSI bus 0 at SCSI address of ID 0 LUN 0 is being mapped to Fibre Port 0 (on the FibreBridge) at Fibre Channel LUN 4.

Fibre Port	FC LUN	SCSI BUS	SCSI ID	SCSI LUN
0	4	0	0	0
0	0	0	1	0
0	2	0	13	0
0	0	0	15	0
0	3	0	1	0
0	10	0	1	1
0	30	0	8	5
0	23	0	8	7



### Note

*Two SCSI devices cannot be mapped to the same FC port and FC LUN. If the same SCSI device is mapped to two different FC ports and/or FC LUNs, these FC port and FC LUNs will be taken offline automatically until the conflict is resolved.*

ATTO ExpressNAV and ATTO BridgeTools make manual mapping easy. For more information, refer to [Mapping](#) on page 67.

You may also map SCSI devices manually by using the Command Line Interface RouteXXX family of commands. The RouteXxxxx and AutoMap commands provide the mechanism to map Fibre Channel Port/LUN to SCSI bus/target/LUN.

**AutoMap** establishes a default mapping of Fibre ports and Fibre LUNs, and the RouteXxxxx

commands manage the mapping, including display of current mapping and modification.

**RouteDisplay** displays the current mapping, in Fibre port, Fibre LUN order, showing the mapped SCSI bus/target/LUN, and the current status of the device (online, offline, unavailable, going offline). RouteDisplay may be used at any time.

**RouteOffline**, **RouteChange**, **RouteOnline** (not available on the FibreBridge 2400) modify the mapping as required (e.g. to make a device inaccessible, to replace a non-functioning mapped unit with another, to manage wear on tape drives).

Before modifying a map, set it **offline** via the **RouteOffline** command. This process notifies the FibreBridge to stop accepting SCSI commands (e.g. data transfers, inquiry, etc.) for the mapped device.

The **RouteOffline** command takes effect in two stages

- 1 The device is marked **Going Offline**, indicating the FibreBridge will complete any current SCSI commands for the mapped device, and will reject any subsequent SCSI commands for that device.
- 2 When all current SCSI commands for the device are complete, the device status transitions to **Offline**, and the FibreBridge rejects any subsequent SCSI commands for that device.

After the device is **Offline** (verify this with the **RouteDisplay** command), use the **RouteChange** command to change its mapping. Use the **RouteDisplay** command to review the changes before setting the affected devices online.

When all changes are complete and correct, use the **RouteOnline** command to set devices online. It is not necessary to set all mapped devices online: SCSI commands sent to offline devices are rejected.

[Appendix A](#) shows the sequence of AutoMap and RouteXxxxx commands.

## 3.1.2 Static device addressing

*Static device addressing presents internal devices and external SCSI devices as a Fibre Channel LUN to a host. All ports on the FibreBridge use the same Fibre Channel node name, but each port has a unique Fibre Channel port name.*

The ATTO FibreBridge allows parallel SCSI devices to participate in a Fibre Channel arbitrated loop or on a fabric. Fibre Channel and parallel SCSI use different models to address devices. The FibreBridge translates between these addressing models.

**AddressMap C** is a CLI command which uses static device addressing rather than route mapping to present internal devices and external SCSI devices as a Fibre Channel LUN to a host. All ports on the FibreBridge use the same Fibre Channel node name, but each port has a unique Fibre Channel port name.

The FibreBridge appears as a single Fibre Channel device. All devices are available on the Fibre Channel port at the same LUN as follows

Peripheral Device Addressing (internal FB LUNs)

BIT	7	6	5	4	3	2	1	0
LUN BYTE 0	0	0	Bus Identifier					
LUN BYTE 1	Target/LUN							

Logical Device Addressing (external SCSI devices)

Bit	7	6	5	4	3	2	1	0
LUN BYTE 0	1	0	Target					
LUN BYTE 1	Bus				LUN			

Exhibit 3.1-3 Sample mappings for AddressMap C

Internal Device:	FC LUN
FibreBridge LUN	0x0000
Services LUN	0x0001

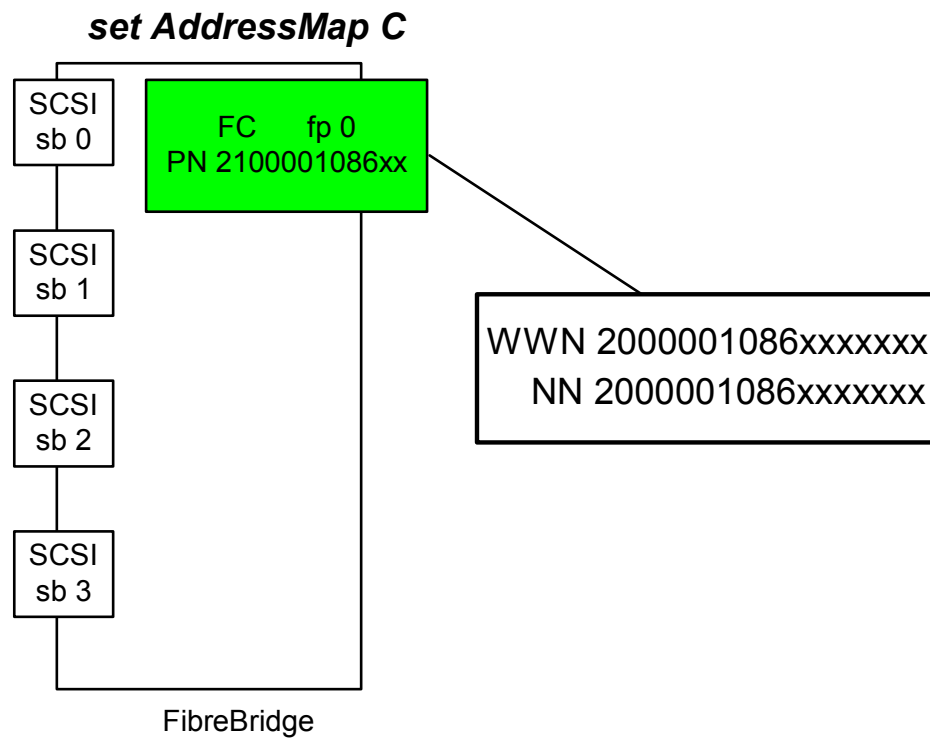
SCSI Device:

Bus	Target	LUN	FC LUN
0	0	0	0x8000
0	1	0	0x8100
0	2	1	0x8201
1	0	0	0x8020
2	3	0	0x8340
3	5	2	0x8562

The Fibre Channel port will report a particular device (both internal and SCSI) at the same LUN. The LUNs reported to a host in response to a **ReportLUNs** command will always contain both the FibreBridge and Services target LUN and the SCSI devices currently attached to the FibreBridge.

Several commands and features are not available in **AddressMap C** mode: **AutoMap**, **FibreBridgeTargetLUN**, **ServicesLUN**, **Route**, **RouteDisplay**, **RouteChange**, **RouteOnline**, **RouteOffline**, **SpeedWrite**, **SpeedWriteDefault**.

Exhibit 3.1-4 NN=Node Name, PN=Port Name.



### 3.1.3 Logical Unit addressing for FB2400 only

*The FibreBridge 2400 may be configured to take advantage of Logical Unit Addressing using the Command Line ASCII-based interface.*

In standard device mapping and formatting, as described in [Static device addressing](#) on page 71, target devices are only visible if you have mapped them specifically to Fibre Channel ports. You may use ATTO ExpressNAV to map devices as described in [Mapping](#) on page 67.

If you enable Logical Unit Addressing through the Command Line Interface (refer to [Using the serial port](#) on page 7), a scan is performed when power is applied to the system and a list is made of all devices. All target devices are visible to all Fibre Channel ports, with each port sharing a common Fibre Channel node name.

One advantage to this method is that you can enable port failover in which a designated Fibre Channel port is marked as **reserve** and becomes active only if another port fails.

To enable Logical Unit Addressing, use the CLI and, at the **Ready** prompt, type

```
set LogicalUnitAddressing enabled
```

To see the SCSI address mappings, type

```
RouteDisplay SCSI
```

You may designate a specific bus, target, LUN.

```
RouteDisplay SCSI <sb> <st> <sLUN>
```



## 3.2 Optional configurations

*Default values are appropriate for most configurations, but may be modified for your needs using ATTO ExpressNAV.*

It is best practice to change the default username and password to a username and password significant to you.

### Change the default username, password

Use ExpressNAV for all models except the FibreBridge 1180. Change defaults using the instructions in the ATTO BridgeTools manual for the FibreBridge 1180.

- 1 If you have not already, open an ExpressNAV session. For instructions, refer to [Open an ExpressNAV session](#) on page 19.
- 2 Click **Bridge**.  
The **Bridge Configuration** page is displayed. The username that you are currently logged in with is displayed in the **Username** text box.
- 3 Enter appropriate information into the **Username**, **Current Password**, **Old Password**, **New Password**, and **Confirm Password** text boxes.



#### Note

*The username is case insensitive and password is case sensitive.*

- 4 Click **Submit**.
- 5 The username and password for all Telnet, FTP and ATTO ExpressNAV sessions is changed.

### Performance

SpeedWrite is a method to improve the performance of FCP WRITE commands to SCSI devices attached to the FibreBridge.

Using the CLI command **SpeedWrite**, you can specify the SCSI bus, target and LUN of a mapped device or specify [all] to set or get the state of all currently mapped SCSI devices.

**SpeedWriteDefault** specifies the state of **SpeedWrite** for any SCSI devices mapped manually or via an **AutoMap** operation. If enabled, any new SCSI device will use **SpeedWrite** performance enhancement by default.

### Advanced diagnostics and SNMP protocol

This feature is not available for the ATTO FibreBridge 1180 or the FibreBridge 2400.

Remote system monitoring is available using Simple Network Management Protocol (SNMP). An agent resides in the FibreBridge which takes information from the FibreBridge and translates it into a form compatible with SNMP. If certain conditions arise, the agent sends asynchronous notifications (traps) to a client.

Refer to [Diagnostic commands](#) on page 46 for complete information on these commands.

- 1 Go the **Advanced** page of the ExpressNAV interface. Refer to [ATTO ExpressNAV interface](#) on page 31
- 2 Set the number of trap client addresses by typing  

```
set SNMPTrapAddress [1-6] [IPAddress] [Level]
```
- 3 Type **set SNMPUpdates enabled**
- 4 Type **set SNMPTraps enabled**
- 5 Type **SaveConfiguration restart**
- 6 Install SNMP management software on each client you wish to receive traps (messages).
- 7 Call technical support (see [Warranty, contact information](#) on page xiii) to get the appropriate MIB file for your FibreBridge.
- 8 For each client, copy the MIB file to the directory containing the SNMP management software.
- 9 From within the SNMP management software, compile the file **attodmnd-mib.mib** according to the software's procedures.
- 10 Unload any default MIBs.
- 11 Load the MIB **ATTO\***.
- 12 When requested, enter the FibreBridge IP address as the **Remote SNMP Agent**.
- 13 The SNMP management software will contact the agent in the FibreBridge. The screen will reply with system information.
- 14 Status will be monitored and reported through the SNMP management software.

## Read only password or username for the FB 2400 only

You may set a read only password or a read only username. Refer to [General use commands](#) on page 37.

- 1 If you have not already, open an ExpressNAV session. For instructions, refer to [Open an ExpressNAV session](#) on page 19.
- 2 Click **Bridge**.  
The **Bridge Configuration** page is displayed. The username that you are currently logged in with is displayed in the **Username** text box.
- 3 Enter the Admin password in the first line of the boxed area.
- 4 Enter the desired information into the **Admin Username, New Admin Password, Confirm New Admin Password or New Read Only Password and Confirm New Read Only Password** text boxes.  
The username is case insensitive and password is case sensitive.
- 5 Click **Submit**.
- 6 The username or password for all Telnet, FTP and ATTO ExpressNAV sessions are changed.

## Port Failover for FB2400 only

The FibreBridge 2400 may be configured to reserve a port to take over in case another port fails.

If you enable Logical Unit Addressing through the Command Line Interface (refer to [Using the serial port](#) on page 7), you can enable port failover in which a designated Fibre Channel port is marked as **reserve** and becomes active only if another port fails.

To enable port failover, enter the CLI and type

```
set FCPortFailover enabled
```

To restore a bridge that has experienced a failover to its pre-failover state, type

```
FCPortRecover
```

To return an active port back to its pre-failover state, type

```
FcPortFailure recover
```

## 4.0 Serverless backup support

*Serverless Backup is an application that allows data to be copied between two storage devices (Fibre Channel disks, SCSI disks and SCSI tapes) with minimal intervention from a server. Serverless backup is not available for the FibreBridge 2400.*

As the volume of data on a network grows, the resources required to back up this data also grow. Data protection requires that large volumes of data be copied from on-line storage devices to dedicated archive devices which places a heavy load on the host processors, I/O busses, memory busses, and front-end network.

Serverless Backup uses the Extended Copy command compliant with T10/99-143r1 to allow a copy manager (the FibreBridge) to execute all of the read and write operations necessary to move data. Blocks of data are moved directly from the Fibre Channel storage through the bridge to SCSI tape or from SCSI storage through the bridge to the SCSI tape, all at Fibre Channel and SCSI speeds.

The ATTO FibreBridge will execute Extended Copy commands to and from SCSI tape drives connected directly to the FibreBridge. The hard drives you are backing up or restoring to can be anywhere on the Storage Area Network, including SCSI drives attached to the bridge. The Extended Copy command contains target and segment descriptors used to define which data is to be moved between which devices.

Target Descriptors allow the host to describe the devices involved in the Extended Copy. To be compatible with all copy agent application packages, the FibreBridge implementation supports World Wide Name, N\_Port ID, and WWN plus N\_Port ID descriptor types.

Segment Descriptors describe the data to copy and how much of it to copy. The FibreBridge supports the two most common types of Segment Descriptors, *block (disk) to stream (tape)* and

*stream (tape) to block (drive)* and the following descriptors: *block to block*, *stream to stream*, *inline to stream*, and *stream to discard*.

The FibreBridge will support copying up to 830 MB of data in a single Extended Copy command. Larger files must be backed up or restored using additional operations. The bridge can support up to eight simultaneous Extended Copy commands.

### How it works

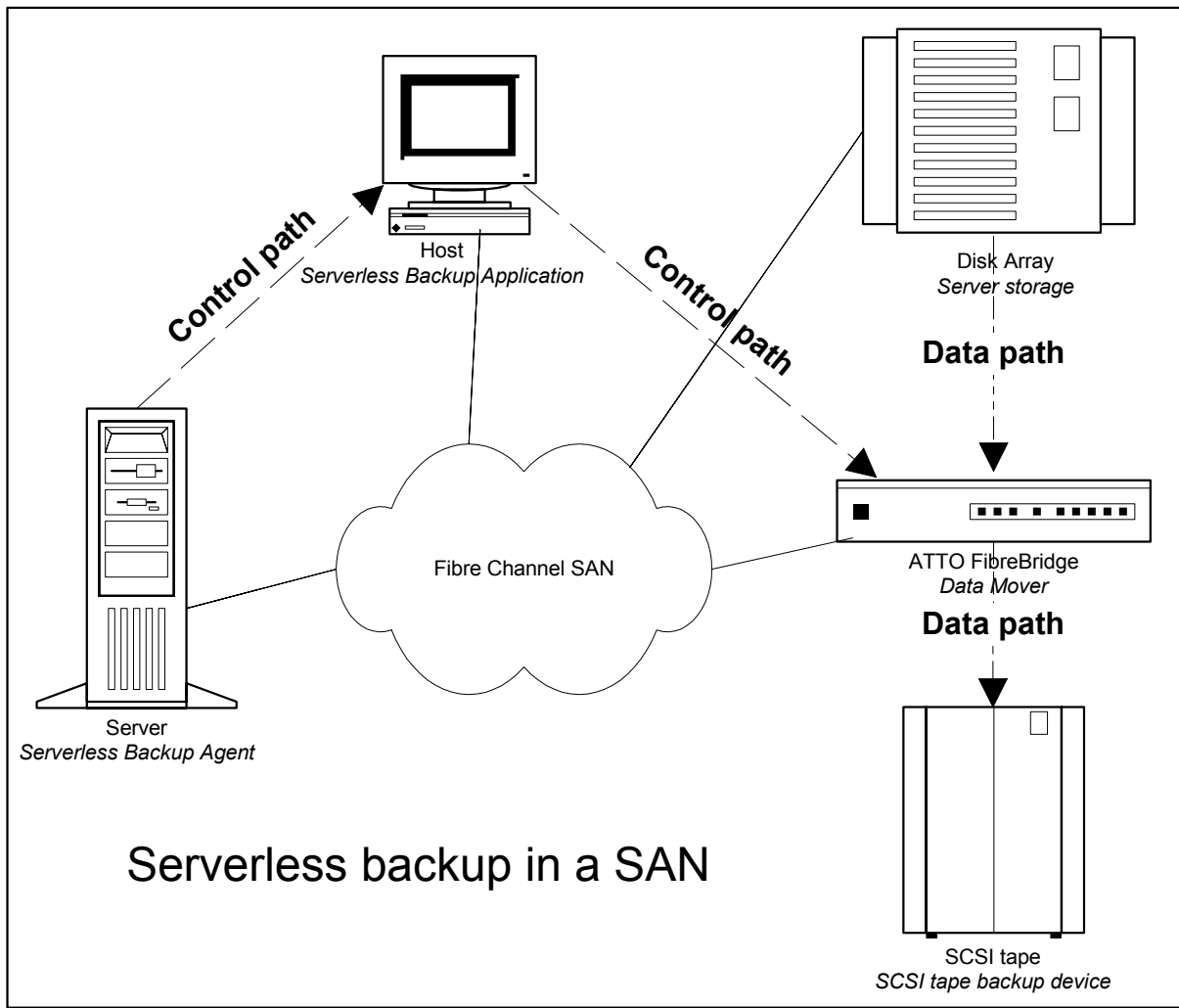
- 1 A copy agent on the server provides a user interface to begin a backup or restore operation as well as manage and synchronize the movement of data sets. This copy agent is either included or available as an add-on with many high-end tape backup software applications on the market.
- 2 The server sends a single **Extended Copy** command to the FibreBridge or to a SCSI device beyond the bridge.
- 3 The bridge interprets the segment descriptors and issues read commands to the appropriate devices.
- 4 Once enough data is read, the bridge will issue write commands to the appropriate device.
- 5 Once all of the segment descriptors have been executed, the bridge will send status to the copy agent running in the server. The data never passes through the server, thus freeing the CPU and Memory to process other requests.

### Procedure

- 1 Enter the Command Line Interface. Refer to [Using the serial port](#) on page 7.
- 2 After the **Ready** prompt, type **set Fcinitiator enabled**.
- 3 Type **saveconfiguration restart**.



*Exhibit 4.0-1 Once the server sends a command to the FibreBridge for extended copy, the FibreBridge manages the backup procedure, by-passing the server.*



## 5.0 Updating firmware

The ATTO FibreBridge has several processors which control the flow of data. The firmware to control these processors can be upgraded in the field using the **WriteBuffer** command over the in-band Fibre Channel connection (not available for the FibreBridge 2400), PUT command from an FTP connection, or **ZModem** utility over an RS-232 serial connection. Use the RS-232 option for the FibreBridge 1180. Use ATTO ExpressNAV for the FibreBridge 2400.



### Note

The recommended management tool for updating firmware for the FibreBridge 2400 is the ATTO ExpressNAV interface. Use the [Update Firmware](#) page. Refer to [Update firmware on the FibreBridge 2400](#) on page 80.

The FibreBridge firmware is distributed as a compressed **.JAR** file and can be obtained from the ATTO Technology, Inc. web site at [www.attotech.com](http://www.attotech.com).

### Preliminary steps

- 1 The FibreBridge firmware is distributed as a compressed .zip file and can be obtained from the ATTO Technology, Inc. web site at [www.attotech.com](http://www.attotech.com) or from the CD which may be included with your Bridge.
- 2 Uncompress the **.zip** file into an image file (**.ima**). Note the filename.



### CAUTION

**Before beginning this procedure, ensure that all I/O to the FibreBridge has stopped.**

**During this procedure, do not interrupt the flash process.**

**Do not power down the host or the FibreBridge until the display returns the Ready prompt.**

**Interrupting the flash process will make your FibreBridge inoperable and you will have to return it to ATTO Technology for repair.**

### To use FTP over Ethernet to flash new firmware into the FibreBridge

- 1 Uncompress the .JAR file obtained from the ATTO Technology Inc. website ([www.attotech.com](http://www.attotech.com)) into an image file (**.IMA**).



### Note

The **.JAR** file can be uncompressed using any utility that supports the **zip** format.

- 2 Establish an FTP link to the bridge that is to be flashed.
- 3 Use the **PUT** command to download the firmware. For example  

```
$ PUT c:\bridge_firmware\FB3200100.IMA
```
- 4 Once the download is complete, cycle power on the FibreBridge to implement the new firmware.

### To use the ZModem command over the RS-232 serial link to load new firmware

- 1 Uncompress the **.JAR** file obtained from the ATTO Technology Inc. website ([www.attotech.com](http://www.attotech.com)) into an image file (**.IMA**).



### Note

The **.JAR** file can be uncompressed using any utility that supports the **zip** format.

- 2 Load a Terminal Program such as Hyper Terminal.
- 3 Set the terminal and the FibreBridge for the highest possible baud rate for your terminal.
- 4 Turn on power to the FibreBridge.
- 5 Once the Ready prompt appears, type **ZMODEM RECEIVE**. The FibreBridge will display that it is preparing to receive a file from your terminal program.
- 6 On the terminal program, choose **Transfer Send File**
- 7 In the **Send File** box, enter the current FibreBridge **.ima** file or click the browse button to find it
- 8 Click **Send File**
- 9 The FibreBridge should acknowledge receiving the file and display a message not to interrupt power for 90 seconds.



#### CAUTION

Do not interrupt the flash process. Do not power down the host or the FibreBridge until the display returns the *Ready* prompt. Interrupting the flash process will make your FibreBridge inoperable and you will have to return it to ATTO Technology for repair.

- 10 Once the download is complete, cycle power on the FibreBridge to invoke the new firmware.

## Update firmware on the FibreBridge 2400



#### CAUTION

Before beginning this procedure, ensure that all I/O to the FibreBridge has stopped.

- 1 Connect to ExpressNAV (refer to [Configuring the Ethernet ports](#) on page 13) and click on the **Firmware** page.
- 2 Click **Browse** and locate the firmware you unzipped in the preliminary steps.
- 3 Click **Upload** and wait until a success message is displayed.



#### CAUTION

Do not interrupt the flash process. Do not power down the host or the FibreBridge until the display returns the *Ready* prompt. Interrupting the flash process will make your FibreBridge inoperable and you will have to return it to ATTO Technology for repair.

- 4 Click the **Restart** link.
- 5 Click on **Restart**.

## Appendix A Mapping command examples

*AutoMap, RouteXxxx and AddressMap commands map devices so that they may be recognized by the FibreBridge. These commands are not available as described for the FibreBridge 2400. Refer to Logical Unit addressing for FB2400 only on page 73.*

### AutoMap

AutoMap      Distributes maps across all Fibre Channel ports.

AutoMap [fp]      Distributes maps across the named Fibre Channel port(s)

The AutoMap command is unavailable in AddressMap C mode.

### RouteDisplay

You may request information about currently mapped routes using the RouteDisplay CLI command.

RouteDisplay	Displays all current maps
RouteDisplay [fp]	Displays all maps for the specified FC port
RouteDisplay [status]	Displays all maps with a given route status
RouteDisplay [[fp] [fl]]	Displays the current map of fp & fl.
RouteDisplay [[fp] [status]]	Displays all maps for a given Fibre Channel port with a named route status
Valid status values	Online Offline Unavailable Available Mapped Unmapped FibreBridge All

### RouteXxxxx commands

Following are samples of the RouteXxxxx command interaction showing actual commands and their output to the Services port.

```
Ready.
SCSIPortList
  3
;SCSI Port      Port Status
  0              O.K.
  1              Disabled

Ready.
FcPortList
  2
;Fibre Port      Port Status
  0              O.K.
```

```
Ready.
set RouteOffline 0 3

Ready.
get RouteOffline 0 3
;fp fl sb st sl On/Offline
  0  3  0  0  0 Offline

Ready.
RouteChange 0 3 1 0 0
```

```
Ready.
set RouteOnline 0 3
```

```
Ready.
get RouteOnline 0 3
;fp fl sb st sl On/Offline
  0  3  1  0  0 Online
```

```
Ready.
RouteDisplay 0 3
  4
;fp fl sb st sl On/Offline
  0  3  1  0  0 Online
xx xx  0  7  0 Reserved
xx xx  1  7  0 Reserved
```

```
Ready.
RouteDisplay 0 online
  8
;fp fl sb st sl On/Offline
  0  0  0  3  0 Online
  0  1  0  3  1 Online
  0  2  0  4  0 Online
  0  3  1  0  0 Online
  0  4 xx xx xx FibreBridge
xx xx  0  7  0 Reserved
xx xx  1  7  0 Reserved
```

```
Ready.
RouteDisplay online
  8
;fp fl sb st sl On/Offline
  0  0  0  3  0 Online
  0  1  0  3  1 Online
  0  2  0  4  0 Online
  0  3  1  0  0 Online
  0  4 xx xx xx FibreBridge
xx xx  0  7  0 Reserved
xx xx  1  7  0 Reserved
```

```
Ready.
RouteDisplay 0
  67
;fp fl sb st sl On/Offline
  0  0  0  3  0 Online
  0  1  0  3  1 Online
  0  2  0  4  0 Online
  0  3  1  0  0 Online
  0  4 xx xx xx FibreBridge
  0  5 xx xx xx Offline
  0  6 xx xx xx Offline
..
  0 62 xx xx xx Offline
  0 63 xx xx xx Offline
```

```
xx xx  0  7  0 Reserved
xx xx  1  7  0 Reserved
```

```
Ready.
RouteDisplay
  67
;fp fl sb st sl On/Offline
  0  0  0  3  0 Online
  0  1  0  3  1 Online
  0  2  0  4  0 Online
  0  3  1  0  0 Online
  0  4 xx xx xx FibreBridge
  0  5 xx xx xx Offline
  0  6 xx xx xx Offline
..
  0 62 xx xx xx Offline
  0 63 xx xx xx Offline
xx xx  0  7  0 Reserved
xx xx  1  7  0 Reserved
```

```
Ready.
set RouteOffline 0 0
```

```
Ready.
get RouteOffline 0 0
;fp fl sb st sl On/Offline
  0  0  0  3  0 Offline
```

```
Ready.
set FibreBridgeTargetLUN 0 0
```

```
Ready.
get RouteOnline 0 0
;fp fl sb st sl On/Offline
  0  0 xx xx xx FibreBridge
```

```
Ready.
get FibreBridgeTargetLUN 0
  2
;fp fl
  0  0
```

```
Ready.
set RouteOffline 0 3
```

```
Ready.
get RouteOffline 0 3
;fp fl sb st sl On/Offline
  0  3  1  0  0 Offline
```

```
Ready.
set SCSIInitId 1 0
```

```
Ready.
```

```

get SCSIInitId 1
Port 1 SCSIInitId = 0

Ready.
RouteDisplay 0 3

```

```

4
;fp fl sb st sl On/Offline
0 3 xx xx xx Offline
xx xx 0 7 0 Reserved
xx xx 1 0 0 Reserved

```

## AutoMap command sequences

The following are examples of typical command sequences used in issuing an AutoMap command. The actual commands and the output to the Services port are shown.

```

Ready.
SCSIPortList
3
;SCSI Port      Port Status
0                O.K.
1                O.K.

Ready.
FcPortList
2
;Fibre Port      Port Status
0                O.K.

Ready.
RouteDisplay online
6
;fp fl sb st sl On/Offline
0 0 0 0 0 Online
0 1 1 4 0 Online
0 7 xx xx xx FibreBridge
xx xx 0 7 0 Reserved
xx xx 1 7 0 Reserved

Ready.
AutoMap
Setting device offline: FC 0 Lun 0.
Setting device offline: FC 0 Lun 1.
Setting device offline: FC 0 Lun 7.
Scanning SCSI bus 0
Scanning SCSI bus 1
SCSI bus 1 scan complete.
SCSI bus 0 scan complete.

Ready.
RouteDisplay online
7
;fp fl sb st sl On/Offline
0 0 0 0 0 Online
0 1 0 2 0 Online
0 2 0 3 0 Online
0 3 xx xx xx FibreBridge
xx xx 0 7 0 Reserved
xx xx 1 7 0 Reserved

```

```

...

Ready.
SCSIPortList
3
;SCSI Port      Port Status
0                O.K.
1                Failed

Ready.
FcPortList
2
;Fibre Port      Port Status
0                O.K.

Ready.
RouteDisplay online
6
;fp fl sb st sl On/Offline
0 0 0 0 0 Online
0 1 1 4 0 Online
0 7 xx xx xx FibreBridge
xx xx 0 7 0 Reserved
xx xx 1 7 0 Reserved

Ready.
AutoMap 0
Setting device offline: FC 0 Lun 0.
Setting device offline: FC 0 Lun 1.
Setting device offline: FC 0 Lun 7.
Scanning SCSI bus 0
Scanning SCSI bus 1
SCSI bus 1 scan complete.
SCSI bus 0 scan complete.

Ready.
RouteDisplay online
7
;fp fl sb st sl On/Offline
0 0 0 0 0 Online
0 1 0 2 0 Online
0 2 0 3 0 Online
0 3 xx xx xx FibreBridge
xx xx 0 7 0 Reserved

```

xx xx 1 7 0 Reserved

## AddressMap

- Map A All Fibre ports active. Internal devices and external SCSI devices are presented as LUNs to a Fibre Channel host using route mapping.
- AddressMap C All Fibre ports active. Uses static device addressing rather than route mapping to present internal devices and external SCSI devices as Fibre Channel LUNs to a host. All devices are available on each Fibre Channel port at the same LUN as follows

### Peripheral Device Addressing (internal FibreBridge LUNs)

BIT->	7	6	5	4	3	2	1	0
Level 1 LUN BYTE 0	0	0	Bus Identifier (always 0)					
Level 1 LUN BYTE 1	Target/LUN (FibreBridge = 0x00, Services = 0x01)							

### Logical Device Addressing (external SCSI devices)

BIT->	7	6	5	4	3	2	1	0
Level 1 LUN BYTE 0	1	0	SCSI Target ID					
Level 1 LUN BYTE 1	SCSI Port Number				SCSI LUN			

The following commands and features are not available in AddressMap C mode

- AutoMap
- FibreBridgeTargetLUN
- ServicesLUN
- RouteDisplay
- RouteChange
- RouteOnline
- RouteOffline
- SpeedWrite
- SpeedWriteDefault

# Appendix A ATTO FibreBridge, FibreBridge family

*The ATTO bridge family of products provides GbE-to-SCSI or Fibre Channel-to-SCSI bridges available as Compact PCI (CPCI) boards, stand alone enclosures that can be fitted for rackmount integration, or desktop units, depending on the model and your needs.*

The ATTO iPBridge and ATTO FibreBridge family of products share common configuration options and functions to provide the most versatile connectivity options available. Each product has been engineered to address specific customer needs. New capabilities are integrated

into products throughout the family as much as possible, requiring only an upgrade of firmware to incorporate them into your SAN (Storage Area Network) or NAS (Network Attached Storage). Check the website, [www.attotech.com](http://www.attotech.com), for the latest firmware updates.

## iPBridge products

Product features	2500C/R/D	2700C/R/D	1500E/D	1550E/D
Number of GigE ports	3	4	1	1
Number of SCSI ports	2	NA	1	1
SCSI interface	LVD/SE	NA	LVD	LVD
Number of FC ports	NA	2	NA	NA
FC interface	NA	SFP	NA	NA
Data transfers	NA	4 Gigabit	NA	NA
Ethernet interface	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet
Data transfer	Wire speed	Wire speed	37 MB/sec.	Wire speed
Configuration	cPCI board Desktop Rack	cPCI board Desktop Rack	Embedded Desktop	Embedded Desktop
Full duplex data transfers	√	√	√	√
Supports Class 2 transfers & direct fabric connect	NA	Class 3 only	NA	NA
Supports error recovery	√	√	√	√
Bridge management available <ul style="list-style-type: none"><li>• Serial</li><li>• Ethernet</li><li>• In-band</li></ul>	√ √ √	√ √ √	√ √ √	√ √ √
Diagnostics	Advanced	Advanced	Standard	Standard
ExpressNAV web management	√	√	√	√
iSCSI SANS	√	√	√	√
NDMP/NAS	√	NA	NA	NA



## Fibre Bridge products

Product features	1180E/D	1290E	2300E/R/D	2350C	3300R	2400C/R/D	4500C/R/D
Number of Fibre Channel ports	1	1	1	1	1	2	1
FC interface	DB9/SC	SFP	SFP	SFP	SFP	SFP	SC
Data transfers	1 Gigabit	2 Gigabit	2 Gigabit	2Gigabit	2 Gigabit	4 Gigabit	1 Gigabit
Number of SCSI ports	1	2	2	2	2	2	4
SCSI interface	LVD/SE	LVD/SE	LVD/SE	LVD/SE	LVD/SE	LVD/SE VHDCI	LVD/SE Ultra2 HVD UltraSCSI VHDCI
Data transfers	Ultra2	Ultra3	Ultra3	Ultra3	Ultra3	Ultra320	Ultra2
Configuration	Embedded board Desktop	Embedded board	Embedded board Rack Desktop	cPCI embedded board	Rack	cPCI board Desktop Rack	cPCI board Desktop Rack
Full duplex data transfers	√	√	√	√	√	√	√
Supports Class 2 transfers	√	√	√	√	√	Class 3 only	√
Supports intermix transfers, direct fabric connect, error recovery	√	√	√	√	√	√	√
Bridge management available							
• Serial	√	√	√	√	√	√	√
• Ethernet	√	√	√	√	√	√	√
• In-band	√	√	√	√	√	√	√
Serverless backup	√	√	√	√	√		√
Supports port failover						√	√
Diagnostics	Standard	Standard	Standard	Advanced	Standard	Advanced	Standard
ExpressNAV web management		√	√	√	√	√	√

## Appendix B Glossary

*Some terms used in the Fibre Channel industry are defined below. More information is available through the Fibre Channel Industry Association ([www.fibrechannel.org](http://www.fibrechannel.org)), the Storage Area Networking Industry Association ([www.snia.org](http://www.snia.org)) and the Fibre Channel Consortium ([www.iol.unh.edu](http://www.iol.unh.edu)).*

Term	Definition
fabric	A Fibre Channel switch or two or more Fibre Channel switches interconnected to physically transmit data between any two N_Ports on a switch or switches.
failover	The substitution of a working system for one which has failed.
FC-AL	Fibre Channel Arbitrated Loop: A Fibre Channel network in which up to 126 systems and devices are connected in a loop topology, with each transmitter connecting to the receiver of the device to its logical right. The Fibre Channel Arbitrated Loop protocol used for transmission is different from Fibre Channel switched and point to point protocols. Multiple FC-AL loops can be connected via a fabric switch to extend the network.
firmware	Software stored in read-only memory (ROM) or programmable ROM (PROM). Firmware is often responsible for the behavior of a system when it is first switched on.
F_port	A port in the Fibre Channel fabric where a N_port may attach
FL-port	A port in the Fibre Channel fabric where a NL_port may attach in an arbitrated loop
hot swapping	Components are removed and replaced while the unit is running, with power to either the component or a device connected to the unit. Not all components are hot swappable: please read installation and maintenance instructions carefully.
initiator device	A component which originates a command
JBOD	Just a Bunch Of Disks: a storage subsystem using multiple independent disk drives with or without RAID configuration.
LED	Light-emitting diode, a type of diode that emits light when current passes through it. Visible LEDs are used as indicator lights on all sorts of electronic devices.
LUN	Logical Unit Number: a SCSI or Fibre Channel identifier of a device
NL port	A port attached to a node in Fibre Channel arbitrated loop or fabric loop configurations
N_port	A port attached to a node used with point to point or fabric configurations
RAID	Originally Redundant Array of Inexpensive Disks, now Redundant Array of Independent Drives: a storage system spanning multiple disk drives.

<b>Term</b>	<b>Definition</b>
SAN	Storage Area Network, a shared storage architecture connecting computers and storage devices for online data access. Each connected system can directly access any attached storage device.
SCSI	Small Computer Systems Interface: a processor-independent standard for system-level interface between a computer and intelligent devices including hard disks, floppy disks, CD-ROM, printers, scanners, etc.
topology	Logical layout of the parts of a computer system or network and their interconnections

## Appendix C Standards and compliances

*The equipment described in this manual generates and uses radio frequency energy. If this equipment is not used in strict accordance with the manufacturer's instruction, it can and may cause interference with radio and television reception. See the ATTO FibreBridge Technical Specification sheet for your particular model for a full list of certifications for that model.*



### FCC Standards: Radio and Television Interference



#### WARNING

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class B computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide a reasonable protection against such interference when operating in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of the following measures:

- Move the receiving antenna.
- Relocate the bridge with respect to the receiver, or move the bridge away from the receiver.
- Plug the computer into a different outlet so the computer and receiver are on different branch circuits.
- If necessary, consult an ATTO authorized dealer, ATTO Technical Support Staff, or an experienced radio/television technician for additional suggestions.

The booklet *How to Identify and Resolve Radio/TV Interference Problems* prepared by the Federal Communications Commission is a helpful guide. It is available from the US Government printing office, Washington, DC 20402, Stock No. 004-000-00345-4.

### Further results of FCC Testing

In certain instances, extraordinary variances in the AC power supplied to this unit will require the operating system's normal error recovery procedure to retry the current SCSI command. In this case, the unit can fully recover with no loss of data, and without user intervention. Note that other exceptional conditions in addition to variances in the AC power, such as improper cabling or unrecognized commands, may also trigger these normal error recovery procedures.



### Canadian Standards

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.



## **European Standards**

### **Declaration of Conformity**

This following statement applies to the ATTO FibreBridge.

This device has been tested in the basic operating configuration and found to be compliant with the following European Union standards:

Application of Council Directive: 89/336/EEC

Standard(s) to which conformity is declared: EN55022, EN50082-1, EN60950

This Declaration will only be valid when this product is used in conjunction with other CE approved devices and when the entire system is tested to the applicable CE standards and found to be compliant.

## Appendix D Fibre Channel accessories

*The following Fibre Channel accessories are available through ATTO Technology. Contact an ATTO Technology authorized sales representative to order.*

### Embedded

#### FibreBridge 1180

- FCBR-1180-ELC Fibre Channel to LVD Ultra2 SCSI Bridge Embedded Board with Copper DB9
- FCBR-1180-ELS Fibre Channel to LVD Ultra2 SCSI Bridge Embedded Board with Optical SC

#### FibreBridge 1290

- FCBR-1290-EL0 2-Gigabit Fibre Channel to LVD Ultra3 SCSI Bridge Embedded Board with SFP

#### FibreBridge 2300

- FCBR-2300-EL0 2-Gigabit Fibre Channel to LVD Ultra3 SCSI Bridge Embedded Board with SFP

#### FibreBridge 2350

- FCBR-2350-000 2-Gigabit Fibre Channel to LVD Ultra3 SCSI Bridge Embedded cPCI Board

#### FibreBridge 4500

- FCBR-4500-CH0 Fibre Channel to HVD Ultra SCSI Bridge cPCI Board
- FCBR-4500-CL0 Fibre Channel to LVD Ultra2 SCSI Bridge cPCI Board

### Desktop/Rackmount

#### FibreBridge 1180

- FCBR-1180-DLC Fibre Channel to LVD Ultra2 SCSI Bridge with Copper DB9

#### FibreBridge 2300

- FCBR-2300-DLO 2-Gigabit Fibre Channel to LVD Ultra3 SCSI Bridge Desktop or Rackmount with SFP

#### FibreBridge 3300

- FCBR-3300-RL0 2-Gigabit Fibre Channel to LVD Ultra SCSI Bridge Desktop or Rackmount

#### FibreBridge 4500

- FCBR-4500-DH0 Fibre Channel to HVD Ultra SCSI Bridge Desktop or Rackmount
- FCBR-4500-DL0 Fibre Channel to LVD Ultra2 SCSI Bridge Desktop or Rackmount

### ATTO FC Rack System (build to order)

#### FC Rack Enclosures with Power Supplies

- FCRS-BAS1-000 Rack System with Single Power Supply
- FCRS-BAS2-000 Rack System with Redundant Power Supplies

#### FibreBridge 3300

- FCBR-3300-RL0 2-Gigabit Fibre Channel to LVD Ultra SCSI Bridge

### Field Replacement Units (FRU)

- PWRA-0000-FRU Power Module for ATTO FC Rack System
- FCBR-3300-RLF ATTO FibreBridge 3300R LVD Replacement Unit

### MIAs

- ADAP-MIAS-BLK MIA Adapter-Short Wave

## GBICS

GBIC-DB90-000	GBIC – DB9 Active Copper Interface
GBIC-HSDC-000	GBIC – HSSDC Active Copper Interface
GBIC-SWFO-000	GBIC – Short Wave Optical Duplex SC Interface
SFP2-0000-000	SFP – Optical LC

## Cables/Copper

CBL-FCCU-003	DB9 Copper Fibre Channel Cable (Unequalized) – 3m.
CBL-FCCU-010	DB9 Copper Fibre Channel Cable (Unequalized) – 10m.
CBL-FCCE-020	DB9 Copper Fibre Channel Cable (Equalized) – 20m.
CBL-HSDB-003	HSSDC to DB9 Copper Fibre Channel Cable (Unequalized) – 3m.
CBL-HSDB-010	HSSDC to DB9 Copper Fibre Channel Cable (Unequalized) – 10m.
CBL-HSHS-003	HSSDC to HSSDC Copper Fibre Channel Cable (Unequalized) – 3m.
CBL-HSHS-010	HSSDC to HSSDC Copper Fibre Channel Cable (Unequalized) – 10m.

## Cables/Optical

CBL-FCFI-005	5 Meter Cable-Duplex 50 Micron Multi-mode FC/Optical
CBL-FCFI-010	10 Meter Cable-Duplex 50 Micron Multi-mode FC/Optical
CBL-FCFI-030	30 Meter Cable- Duplex 50 Micron Multi-mode FC/Optical

## Cables/FibreChain

CBL-FCFC-001	FibreChain 24” Cable Cables/SCSI
--------------	----------------------------------

## Cables/SCSI

CBL-FP68-C3	68-pin “P” / 50-pin Centronics – 1m
CBL-FP68-C6	68-pin “P” / 50-pin Centronics – 2m
CBL-FP68-C25	68-pin “P” / 50-pin Centronics – 8m
CBL-FP68-C79	68-pin “P” / 50-pin Centronics – 24m
CBL-F68E-00X	68-pin “P” / 68-pin fine pitch “P” – 1ft
CBL-U68E-681	68-pin “P” / 68-pin fine pitch “P” – 1m
CBL-F68E-686	68-pin “P” / 68-pin fine pitch “P” – 2m
CBL-F68E-003	68-pin “P” / 68-pin fine pitch “P” – 3m
CBL-F68E-010	68-pin “P” / 68-pin fine pitch “P” – 10m
CBL-F68E-025	68-pin “P” / 68-pin fine pitch “P” – 25m
CBL-F68E-68X	68-pin “P” / 68-pin fine pitch “P” – 16m.

CBL-V68E-4868-pin offset VHDCI to 68-pin VHDCI

## Appendix B Warranty, contact information

---

### **Manufacturer limited warranty**

Manufacturer warrants to the original purchaser of this product that it will be free from defects in material and workmanship as described in the ATTO Technology website, [www.attotech.com](http://www.attotech.com). Manufacturer liability shall be limited to replacing or repairing, at its option, any defective product. There will be no charge for parts or labor should Manufacturer determine that this product is defective.

Products which have been subject to abuse, misuse, alteration, neglected, or have been serviced, repaired or installed by unauthorized personnel shall not be covered under this warranty provision. Damage resulting from incorrect connection or an inappropriate application of this product shall not be the responsibility of Manufacturer. Manufacturer's liability is limited to Manufacturer's product(s); damage to other equipment connected to Manufacturer's product(s) will be the customer's responsibility.

This warranty is made in lieu of any other warranty, express or implied. Manufacturer disclaims any implied warranties of merchantability or fitness for a particular purpose.

Manufacturer's responsibility to repair or replace a defective product is the sole and exclusive remedy provided to the customer for breach of this warranty. Manufacturer will not be liable for any indirect, special, incidental, or consequential damages irrespective of whether Manufacturer has advance notice of the possibility of such damages. No Manufacturer dealer, agent or employee is authorized to make any modification, extension or addition to this warranty.

### **Contact ATTO Technology, Inc.**

Customer service, sales and technical support are available by phone Monday through Friday, 8 a.m. to 5 p.m EST., or by fax and web site 24-hours a day.

ATTO Technology, Inc.  
155 CrossPoint Parkway  
Amherst, New York 14068  
(716) 691-1999 • voice  
(716) 691-9353 • fax  
<http://www.attotech.com>

ATTO Technology can also be reached via e-mail at the following addresses:

*Sales Support:* [sls@attotech.com](mailto:sls@attotech.com)  
*Technical Support:* [techsupp@attotech.com](mailto:techsupp@attotech.com)





# Index

<b>Numerics</b>	
10/100Base-T	4
<b>A</b>	
Addressing	69, 71
AddressMap	41, 71, iv
AL_PA	69
ASCII	39
ATTO	31
ATTO BridgeTools	35
AutoLogSense	41
AutoMap	41, 70, i
<b>B</b>	
BootFibreDelay	41
BootScan	41
BootScanPorts	41
BridgeTools	29, 35, 70
Browser compatibility	31
<b>C</b>	
Canadian standards	ix
ClearEventLog	41
ClearTraceLog	41
CLI	39, 41
Command Line Interface	29, 39, 41
Configuration	75
Configuration modification	75
configuring	
Ethernet ports	6
Connect devices	3
<b>D</b>	
Date	41
Date configuration	34
DB-9	4, 7
defaults	6
DHCPFixedDelay	41
Diagnostics	75
DispFCPortDB	41
Display mapping	70
DisplayEventLog	41
DisplayEventLogFilter	41
DisplayTraceLog	41
DisplayTraceLogFilter	41
DumpEventLog	41
DumpTraceLog	41
<b>E</b>	
EccLog	41
ErrorLog	41
Ethernet	33
configuring	6
EthernetSpeed	41
European standards	x
EventLog	41
EventLogFilter	41
Exit	41
ExpressNAV	5, 29, 31, 67, 70
Extended copy	77
<b>F</b>	
F_port	vii
Fabric	vii
Failover	vii
FC-AL	vii
FCAck0	41
FCC	ix
FCClass2	41
FCConnMode	41
FCDataRate	41
FCFairArb	41
FCFullDuplex	41
FCHard	41
FCHardAddress	42
FCInitiator	42
FCP2	42
FCP2Conf	42
FCPortList	42
FCSCSIBusyStatus	42
FCTargets	42
FCWWName	42
Fibre	33
Fibre Channel configuration	33
Fibre Channel connections	3
Fibre Channel definition	1
FibreBridge 1180 interface	35
FibreBridge 1180D	9
FibreBridge 1180E	11
FibreBridge 1290E	13
FibreBridge 2300E	19
FibreBridge 2300R/D	15
FibreBridge 2350C	21
FibreBridge 2400C	25
FibreBridge 2400R/D	23
FibreBridge 3300R	27
FibreBridge definition	1
FibreBridge management	34
FibreBridge Services	29, 31, 37, 39
FibreBridgeModel	42

FibreBridgeName .....	42
FibreBridgeTargetLUN .....	42
Firmware .....	vii
FirmwareRestart .....	42
FixedLengthReqSense .....	42
FL-port .....	vii

## G

GUI .....	31
-----------	----

## H

Hard addressing .....	69
Help .....	34, 42
Hot swapping .....	vii

## I

IdentifyFibreBridge .....	42
In-band CLI .....	37
Info .....	42
Initiator device .....	vii
Interfaces .....	29
IPAddress .....	42
IPDHCP .....	42
IPGateway .....	42
IPSubnetMask .....	42
IsReserved .....	42

## J

Java .....	31
JBOD .....	vii

## L

LED .....	vii
LUN .....	vii

## M

Mapping .....	34, 69, 71, i
MaxOpTemp .....	42
Menu .....	36, 42
MIB .....	75
MinOpTemp .....	42

## N

N_port .....	vii
NL_port .....	vii

## O

OpTempWarn .....	42
------------------	----

## P

ParityLog .....	42
Password .....	31, 42
password, default .....	6
Performance .....	42

## R

RAID .....	vii
Release .....	65
Remote .....	75
Reserve .....	37, 42, 64, 65
Restart firmware .....	34
RestoreConfiguration .....	42
RouteChange .....	43
RouteDisplay .....	43
RouteOffLine .....	43
RS-232 .....	7, 35, 36

## S

Sample mappings .....	71
SAN .....	1
SaveConfiguration .....	43
SCSI .....	viii
SCSI configuration .....	33
SCSI connections .....	3
SCSIInitId .....	43
SCSIPortBusSpeed .....	43
SCSIPortList .....	43
SCSIPortReset .....	43
SCSIPortResetOnStartup .....	43
SCSIPortSelTimeout .....	43
SCSIPortSyncTransfer .....	43
SCSIPortTaggedQueuing .....	43
SCSIPortWideTransfer .....	43
SCSITargets .....	43
SCSITermination .....	43
Serial port .....	4, 5, 7
Serial port configuration .....	33
SerialNumber .....	43
SerialPortBaudRate .....	43
SerialPortEcho .....	43
SerialPortStopBits .....	43
Serverless backup .....	77
ServicesLUN .....	43
SES .....	37
SNMP .....	75
SNMPDumpMIB .....	43
SNMPExtendedTraps .....	43
SNMPTrapAddress .....	43
SNMPTraps .....	43
SNTP .....	43
SNTPServer .....	43
Soft addressing .....	69
SpeedWrite .....	43
SpeedWriteDefault .....	43
Start .....	8
Status .....	33

## T

Telnet .....	7, 35
--------------	-------

Temperature .....	43
terminal emulation .....	5, 7
text .....	36
Time .....	43
Time, date configuration .....	34
TimeZone .....	43
Topology .....	viii
TraceLog .....	43
TraceLogFilter .....	43

## **U**

Update firmware .....	79
Username .....	31, 43
username, default .....	6

## **V**

VerboseMode .....	43
-------------------	----

VirtualDriveResponse .....	44
Voltage .....	44

## **W**

WrapEventLog .....	44
WrapTraceLog .....	44
WWN .....	69

## **X**

XCDevices .....	44
XCErrors .....	44
XCStatus .....	44

## **Z**

Zmodem .....	44
--------------	----

